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LEAKINESS

Literal & Phenomenal



Jesse Ganes

Jonathan Massey

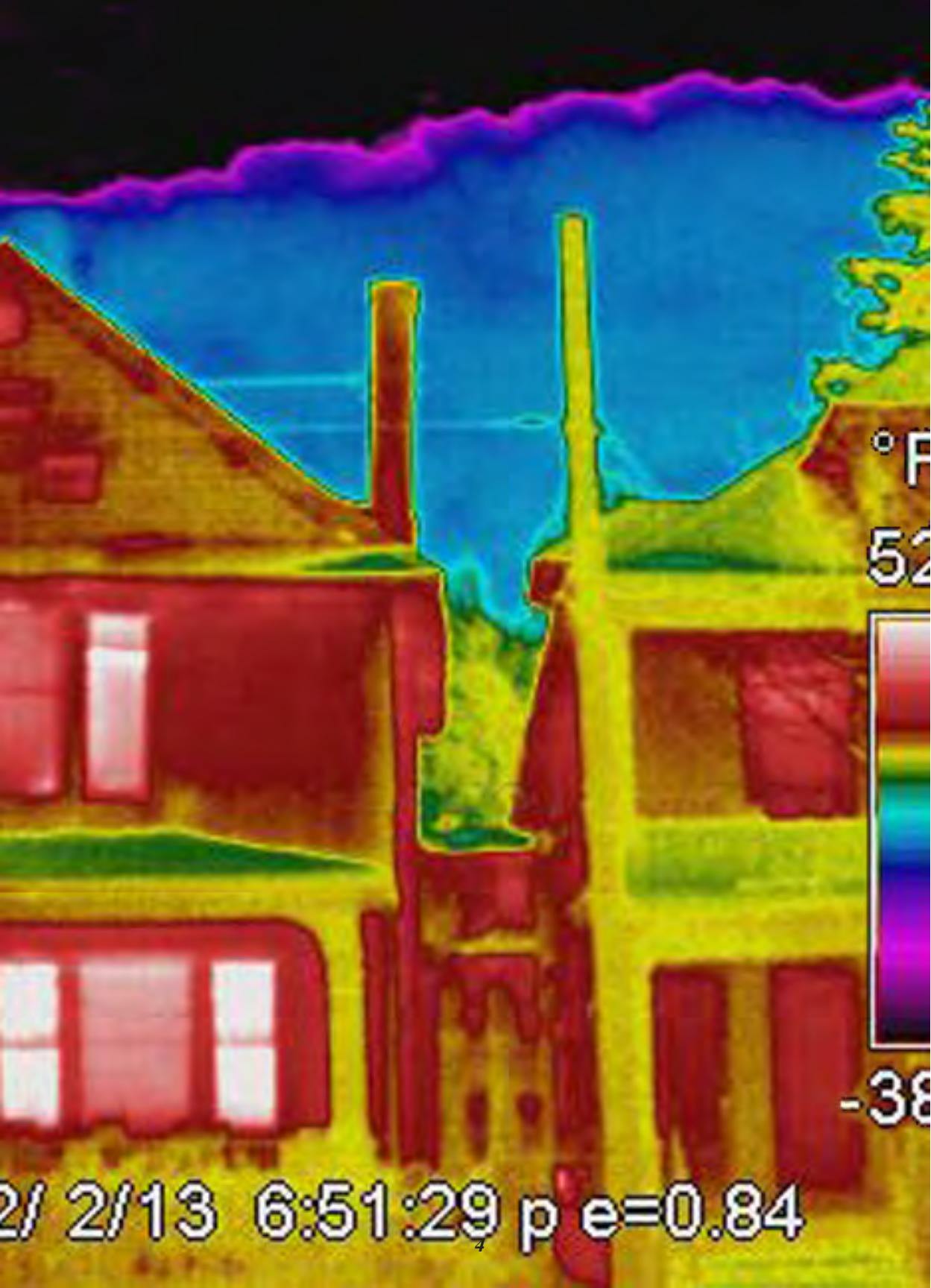
Alan Smart

Syracuse University School of Architecture

Thesis ARC 508 / Fall 2014

LEAKINESS

Literal & Phenomenal



Claim

Architecture can be conscious of the ways in which it leaks.

Project

By designing a series of house-like pavilions that leak (fluids and information) in specific ways, this thesis will develop an explicit lexicon for architects to employ in managing the ‘metadata’ that buildings perpetually emit.

As a matter of design, these structures will operate on the leaked visible, non-visible, and absent metadata generated incidental to our occupation of buildings. The pavilions will ultimately probe similar sets of conditions, each conveying a radically different tone. Whether stopping or amplifying, scrambling or spoofing, deceiving or decoding, they seek to effect a measurable change on the metadata leaked from within.

In order to objectively critique their effects, the pavilions will initially tackle a single metadata type each possessing a distinct tone. Following these tests the pavilions will probe three or more forms of metadata leakage simultaneously, testing architecture’s capacity to consciously manage multiple forms of leakage.

Background

Architecture's primordial task is to define interior space from the exterior world.

With its walls, it seeks to create absolute enclosures—shielding the prosaic elements of fire, air, earth, and water from its artificially conditioned, constructed interior realm. It privileges the purity of enclosed space employing the latest technologies to combat the forces of nature: erosion, weathering, and decay.

The envelope of architecture is a layered proposition where structure, material, aesthetics, and building code come together to form environmental enclosure. In addition to satisfying the primal human need for shelter by generating a refuge from the elements, the envelope has a social role in constructing feelings of comfort, notions of safety, expectations of privacy, and ideals of home. Its existence as a physical boundary tempers the way we behave within it. With its perceived air-tightness, architecture constructs a space disconnected from the forces of the external world.

However, architecture leaks. Water, air, and sound leak into and leak out of material assemblies. Universal properties such as thermal expansion, air and water pressure deviation, and weather work to erode the building envelope.

Architects are typically good at stopping leaks that can be sensorially perceived. However, architecture has long been subjected to the infiltration and exfiltration of elements that do not leave perceptible traces. Radio waves, thermal fingerprints, electromagnetic fields and digital data shadows generated by our every action are rarely consciously managed by architecture.

Freely flowing through the building envelope, these transmissions are largely impervious to the conventional material boundaries of architecture. In remaining neutral to these elements, architecture is susceptible to an alternate form of leakiness—one that does not necessarily constitute a material failure of the building envelope.

One can for this reason distinguish between a literal and phenomenal leakiness.

Where the condition of literal leakiness presupposes the existence of both a physical “hole or fissure” in the building's envelope and a pressure differential between its interior and exterior, phenomenal leakiness does not.¹

Phenomenal leakiness is the condition by which the envelope of one's occupancy is misaligned with the building envelope, broadcasting its occupation to the outside world. There is no clear physical boundary for this envelope, however, its presence is quantified in the form of visible, non-visible, or absent metadata. In synthetically reading this metadata one can infer the condition, position, and activities occurring within.

Architects currently unknowingly manage phenomenal leakiness as solely a visual condition. Operable or transparent windows and doors allow for images of occupancy to escape from architecture. In the present age of big data and state-sanctioned surveillance in which our personal metadata and data shadows serve to reveal, architecture has the potential to intervene by actively designing leakage.

1. “leaky, adj.”. OED Online. September 2013. Oxford University Press. <http://www.oed.com/view/Entry/106664?redirectedFrom=leaky> (accessed October 27, 2013).

Audience

This thesis posits that a more comprehensive leak management is an important addition to the disciplinary toolkit of architecture. Operating as critical plumbers of sorts, architects can form connections between material space that architecture typically inhabits and the immaterial ‘hertzian space’ generated by our ever-increasing engagement with networked technologies.

This work also aims to raise awareness to the consequences of leakage. In operating typologically at a domestic scale, the work will be accessible both to architects and the general public.

thesis prep

Research

I. Taxonomy of Metadata

This catalog of metadata illustrates the differing types of leakage and their parent categorizations.

II. Leaky House

This probe serves to illustrate and identify the ways in which the envelope of the prototypical tract house (1958 Levittown Cape model) is ambivalent in managing phenomenal leakiness. Four images each illustrate the same fictitious condition of residential occupancy through vastly different types of metadata. When overlaid and aligned, they represent a fantastically transparent—synthetically eroding the building envelope through a study of its visible, non-visible, and absent metadatas.

III. NSA Pavilion

Where the Leaky House displays how residential architecture perpetually leaks, this translation of the NSA headquarters at Fort Meade displays how the atypical secure office building does not leak. In this translation, the building envelope becomes a charged zone of public occupation where one can experience the paranoid material approach employed throughout the building to stop the leakage of metadata and minimizing the informational imprint of the building. Within, an opaque volume clad in HVAC diffusers, standard ceiling tiles, and security cameras represents the most secure interior zone.

IV. Strategies for Metadata Management

V. Works Cited

VI. Leakiness (Article)

VII. Privacy Parade

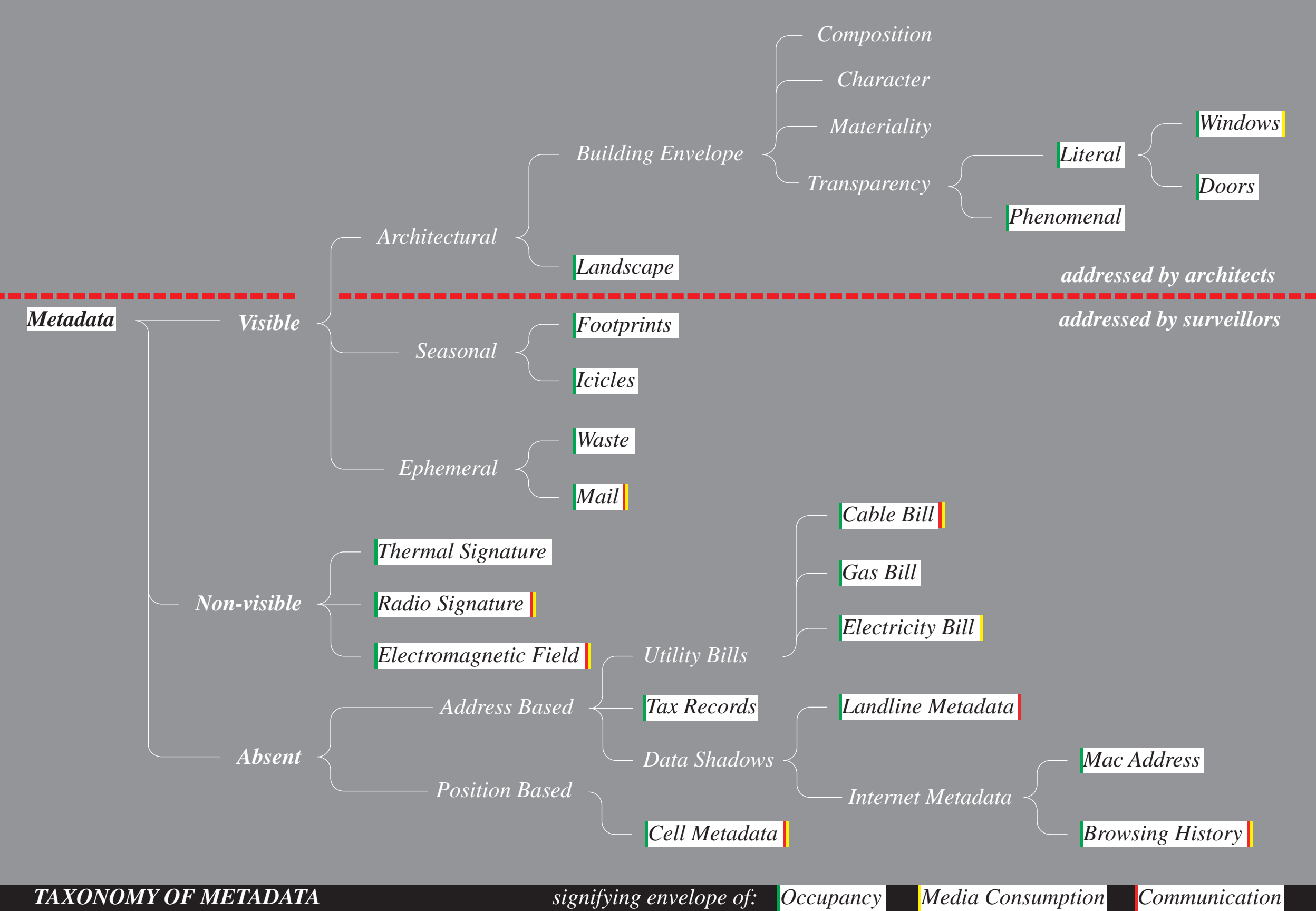
thesis

metadata²

n. a set of data that describes and gives information about other data.

I. Taxonomy of Metadata

2. "metadata, n." OED Online. September 2013. Oxford University Press. <http://www.oed.com/view/Entry/117150?redirectedFrom=metadata#eid37413841> (accessed 8 December, 2013)



Envelope | Envelope

Similar to the way metadata imprinted on paper envelopes (postage, addresses, zip codes, names, security windows and patterns, paper stock and postmarks) leak the approximate size, origin, destination, path, and quality of its interior contents, the materiality, transparency, character, and composition of elements on a building's envelope leak its internal spatial organization and hint at its occupation.³

3. "Phenomenal Transparency" as defined by Colin Rowe
Colin Rowe and Robert Slutzky, "Transparency, Literal and Phenomenal," *Perspecta*, Vol. 8. (1963), 45-54



\$0.37
Date of sale
04/20/04
02 1P00
02312548
U.S. POSTAGE AS IB0028200102301

Metadata

Metadata

<i>Dirt</i>	<i>Envelope</i>
Facade, Ronchamp	Window with exposed security pattern
<i>Envelope</i>	<i>Materiality</i>
Torn Envelope	Facade, Yale Center for British Art

Metadata

Metadata



Visible

Visible metadata ranging from the ephemeral to the environmental further quantifies phenomenal leakage. This metadata is active and ever-changing with building occupancy.



Metadata

Environmental
Condensate on window
Seasonal
Icicles



Metadata



Metadata



Metadata



Metadata



Metadata

Visible	Transparency
Night light leak, Brooklyn, NY	Facade, Lafayette Park
Ephemeral	Visible
Urban Garbage	Red house number, Florence, Italy

Non-visible

Clothes washer



Television

Electric range



Microwave oven



Metadata invisible to the naked eye is also leaked through the building envelope comprised of wavelengths outside of the visible spectrum. They must be synthetically measured and imaged in order to quantify them.

Fluorescent lamp



Electric razor

Hair dryer



Conventional electric blanket

New "low magnetic field" electric blanket

22

Distance from source

0.03 m

0.3 m

0.8–40 μ T

0.2–3 μ T

2.5–50

0.04–2

6–200

0.4–4

75–200

4–8

40–400

0.5–2

15–15,000

0.1–9

6–2,000

0.1–7

0.01 m

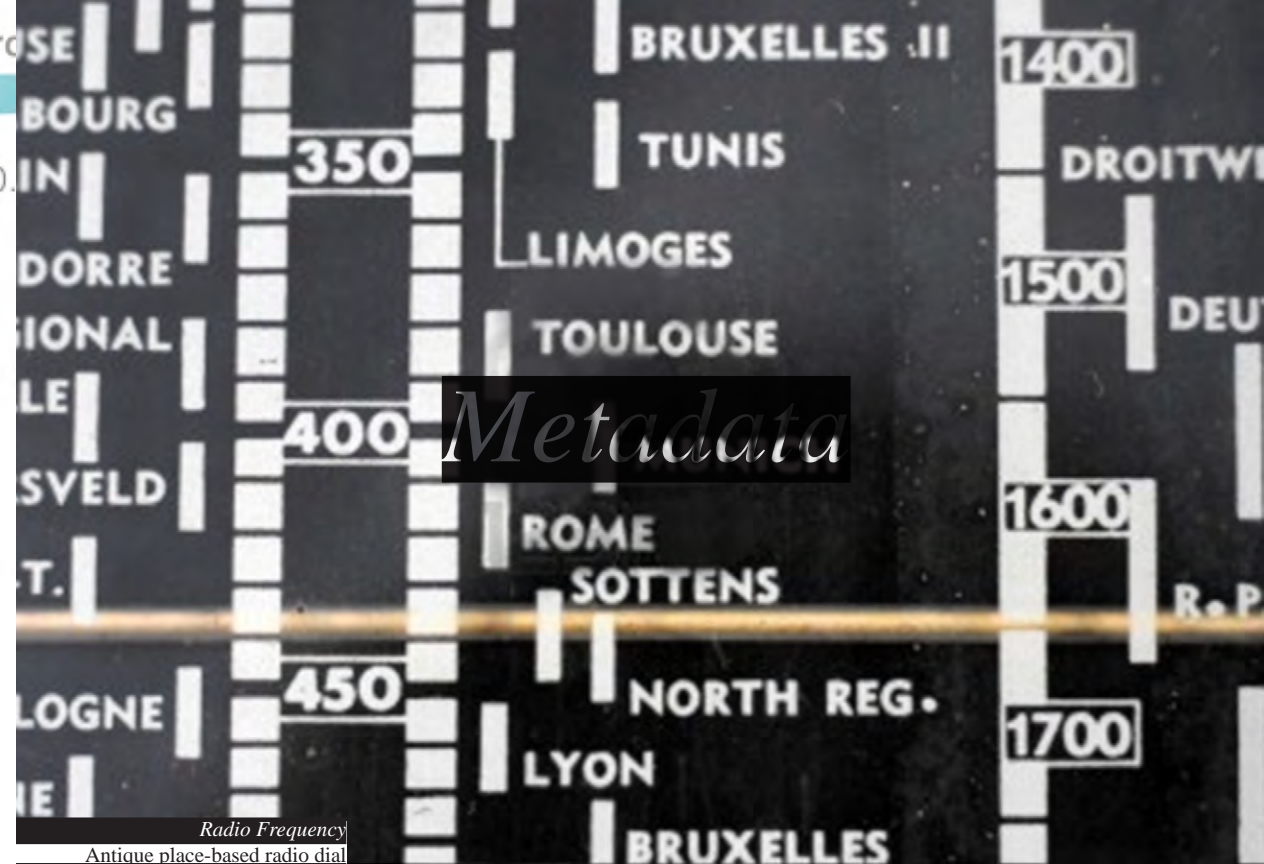
avg. in body

10 μ T

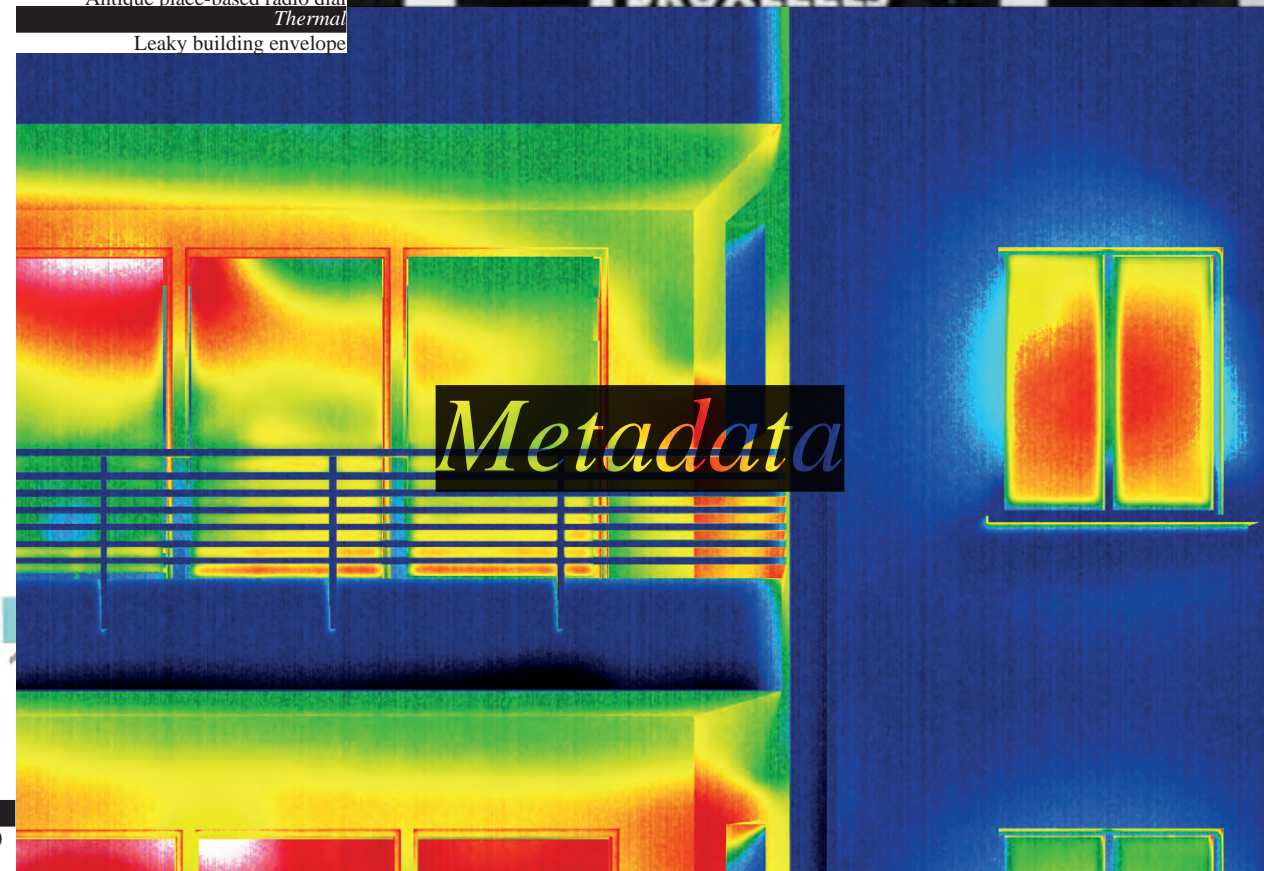
1.5 μ T

1

Electromagnetic
EM Fields of common objects (EPA)



Metadata



Delivered-To: jessejanes@gmail.com
Received: by 10.43.46.131 with SMTP id uo3csp239326icb;
Tue, 1 Oct 2013 07:58:52 -0700 (PDT)
Return-Path: <3K-NKUHAJCrQUjjUffcha.giVcfYagUcf.WigdYmmYaUhYmagUcf.Wig@doclist.bounces.google.com>
Received-SPF: pass (google.com: domain of 3K-NKUHAJCrQUjjUffcha.giVcfYagUcf.WigdYmmYaUhYmagUcf.Wig@doclist.bounces.google.com designates 10.59.7.228 as permitted sender) client-ip=10.59.7.228
Authentication-Results: mr.google.com;
spf=pass (google.com: domain of 3K-NKUHAJCrQUjjUffcha.giVcfYagUcf.WigdYmmYaUhYmagUcf.Wig@doclist.bounces.google.com designates 10.59.7.228 as permitted sender) smtp.mail=3K-NKUHAJCrQUjjUffcha.giVcfYagUcf.WigdYmmYaUhYmagUcf.Wig@doclist.bounces.google.com;
dkim=pass header.i=@gmail.com
X-Received: from mr.google.com ([10.59.7.228])
by 10.59.7.228 with SMTP id dfr286051v
Tue, 01 Oct 2013 07:58:51 -0700 (PDT)
DKIM-Signature: v=1; a=rsa-sha256; c=relaxed/relaxed;
d=gmail.com; s=20120113;
h=mime-version:message-id:date:subject:-
from:to:cc:content-type;
bh=jrThuC3XmKO+3Q+UVd5nKm9cnhKJAXUPvpblQS-
9Jf3w=;
b=TM1/BiPkUfUk/xkCmjGWDyfCVtMHj5J3e0KnXDWNM1-WOD9Wv3d1/eozydztkCn0Q/Z
dmKfbNr63vMMk0GTJDGPYMcEQGT63C1abYLMC-asvCOhp3Vi7eLnXu5AhykwYA6+eSJyH
3Vk5lg+4YeuBhIkpF/XekNbQAWfPsQtOt84Wi01nJ/MTx-8K4XcoFPDgqvXtQR2+dPWIN
9lw8/8cPyhXRF2+d44LkY3Bxz/f6tw+xoS8Lo/Lt5JyT-8kXoNDPMGZydlMx4vR+M82QO
xI+sFwE99Ek2MP6i7TqigLCHk0UHhlo2v1alp8SYg8dsN-0f7PGB+pdhlzBz+pmwoI8wm
ooxg==
MIME-Version: 1.0

Absent

Absent metadata defines the occupation of architecture specifically in reference to markers of location such as street address, zip code, ip address, cell tower triangulation, IEMI, mac address, or gps.

MIS:	311500	Tax ID:	052.-04-
Property #:	1601005400 (Click for tax info)		
Tax Map ID / Property Data			
Status:	Active	Roll Section:	
Address:	874 Ackerman Ave & Stratford		
Property Class:	410 - Inn/Inn	Site Property Class:	
City:	Anytown, NY	In Ag. District:	
Planning Code:	002 -	Bldg. Style:	
Neighborhood:	15950 -	School District:	
Legal Property Description:	Lot 19 Bl1o Tr West 39.6x135 Whxgar		
Tax Acreage/Size:	39.6 x 135	Equalization Rate:	
Land Assessment:	2013 - \$15,300	Total Assessment:	
Full Market Value:	2013 - \$121,951		
Deed Book:	5200	Deed Page:	
Grid East:	622564	Grid North:	

Tax Data
874 Ackerman Ave, Syracuse NY
Utility Bill
Sample National Grid statement

Special Districts for 2010			
ACCOUNT NUMBER	PLEASE PAY BY	AMOUNT DUE	
XXXXX-XXXXX	Feb 3, 2010	\$ 389.53	

Enrollment Information			
To enroll with a supplier or change to another supplier, you will need the following information about your account:			
Loadzone: Central			
Acct No: XXXXX-XXXXX Cycle: 6, INGE			
Electric Usage		Gas Usage	
Month	kWh	Month	Therms
Jan 09	1555	Jan 09	188
Feb 09	1259	Feb 09	181
Mar 09	1195	Mar 09	148
Apr 09	1340	Apr 09	109
May 09	1081	May 09	56
Jun 09	942	Jun 09	25
Jul 09	1132	Jul 09	19
Aug 09	1166	Aug 09	15
Sep 09	1330	Sep 09	15
Oct 09	1148	Oct 09	28
Nov 09	1115	Nov 09	59
Dec 09	1531	Dec 09	91
Jan 10	1541	Jan 10	179

Choosing an Energy Supplier You can choose who supplies your energy. No matter which energy supplier you choose, National Grid will continue to deliver energy to you safely, efficiently and reliably. We will also continue to provide your customer service, including emergency response and storm restoration. National Grid is dedicated to creating an open energy market that lets you choose from a variety of competitive energy suppliers, who may offer different pricing options. For information on

DETAIL OF CURRENT CHARGES

Delivery Services

Electricity Delivery

Service Period	No. of days	Current Reading	-	Previous Reading	=	Total Usage
Dec 7 - Jan 7	31	95566 Actual		94025 Actual		1541 kWh
METER NUMBER XXXXX-XXXXX NEXT SCHEDULED READ DATE Feb 5						
RATE Electric SC1 Non Heat						
Basic Service (not including usage)						
		932841	x	1541 kWh		66.1
		161626	x	1541 kWh		25.0
Incr State Assessment		0.00307	x	1541 kWh		4.1
SBC/RPS		0.00483192	x	1541 kWh		7.1
Transmission Rev Adj		0.00028	x	1541 kWh		0.1
Tariff Surcharge		2.04082 %				2.1
Total Electricity Delivery						\$ 123.1

Gas Delivery

Service Period	No. of days	Current Reading	-	Previous Reading	=	Measured CCF	x	Therm Factor	=	Total Usage
Dec 7 - Jan 7	31	6624 Actual		6450 Actual		174		1.02747		174
METER NUMBER XXXXXXXX NEXT SCHEDULED READ DATE Feb 5										
RATE Gas SC1 Res Heat										

Metadata

II. Leaky House

Visible

Smoke

Landscape

Light

Cool Light

Blinds Up

Icicles

Blinds Down, Lights On

Blinds Down, Lights Off.

598439 kWh, 0151 Therms

Light

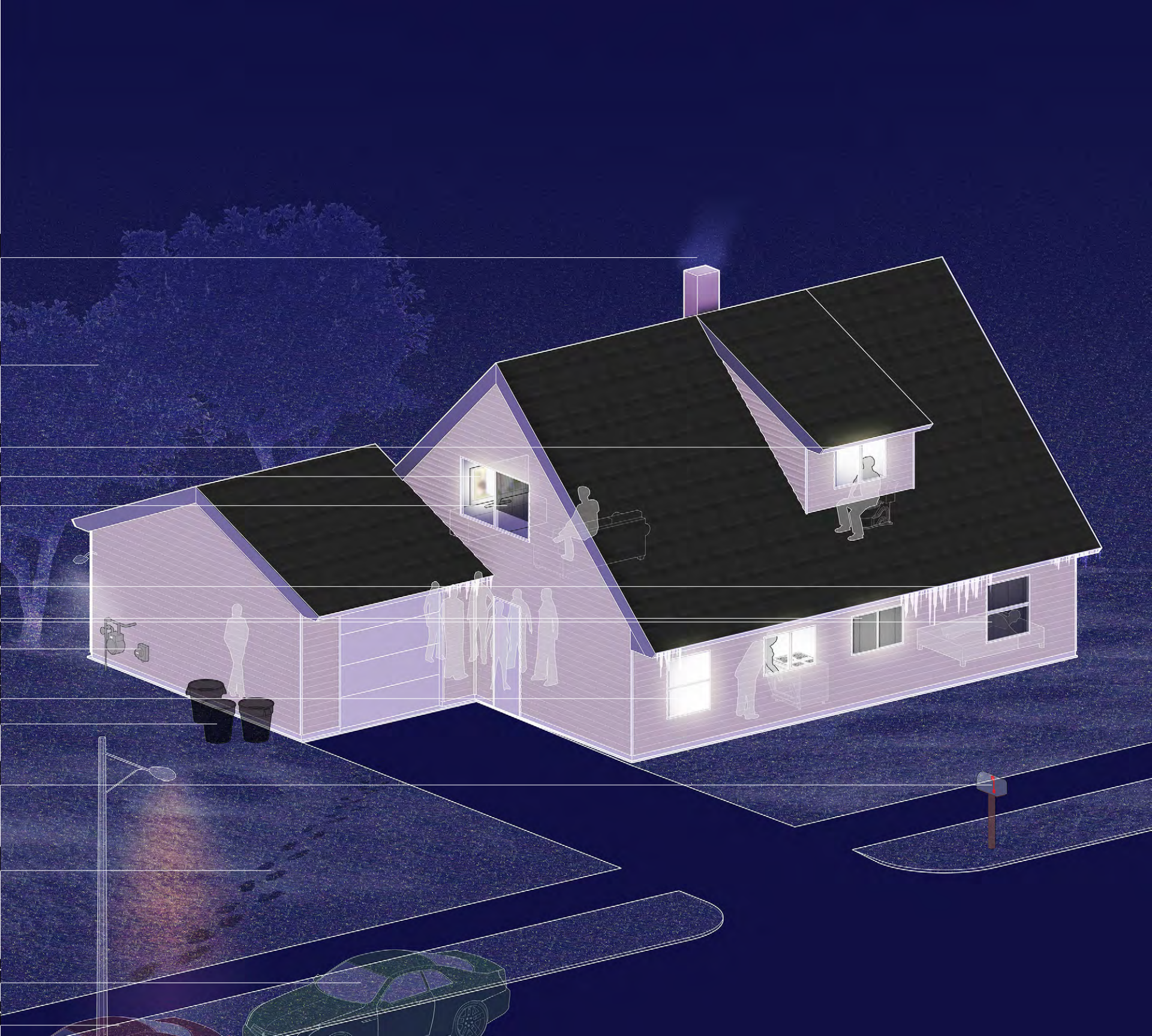
Waste

Mailbox, Flag Up

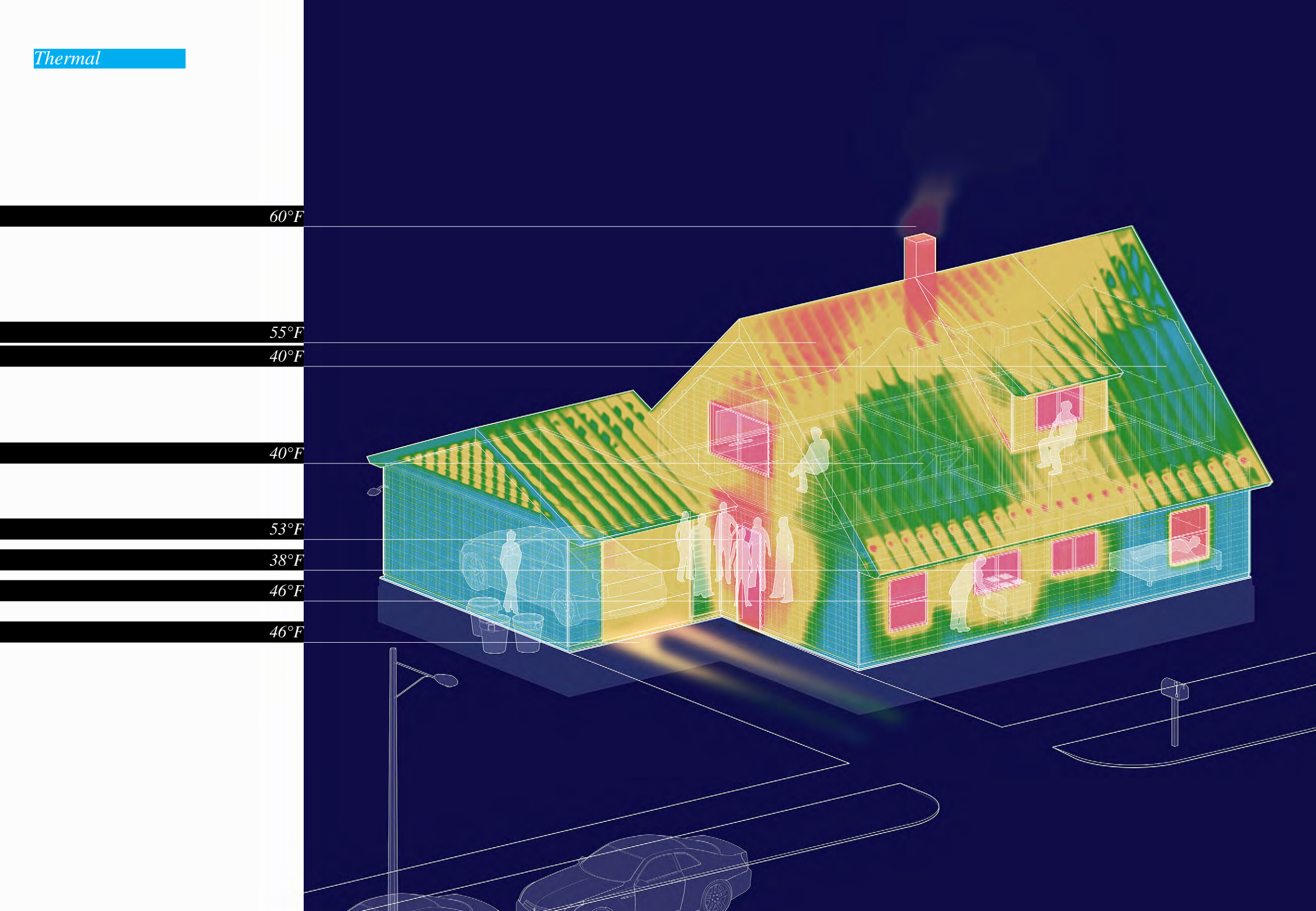
Footprints

Green Car

Red Car



Thermal



2 μT .

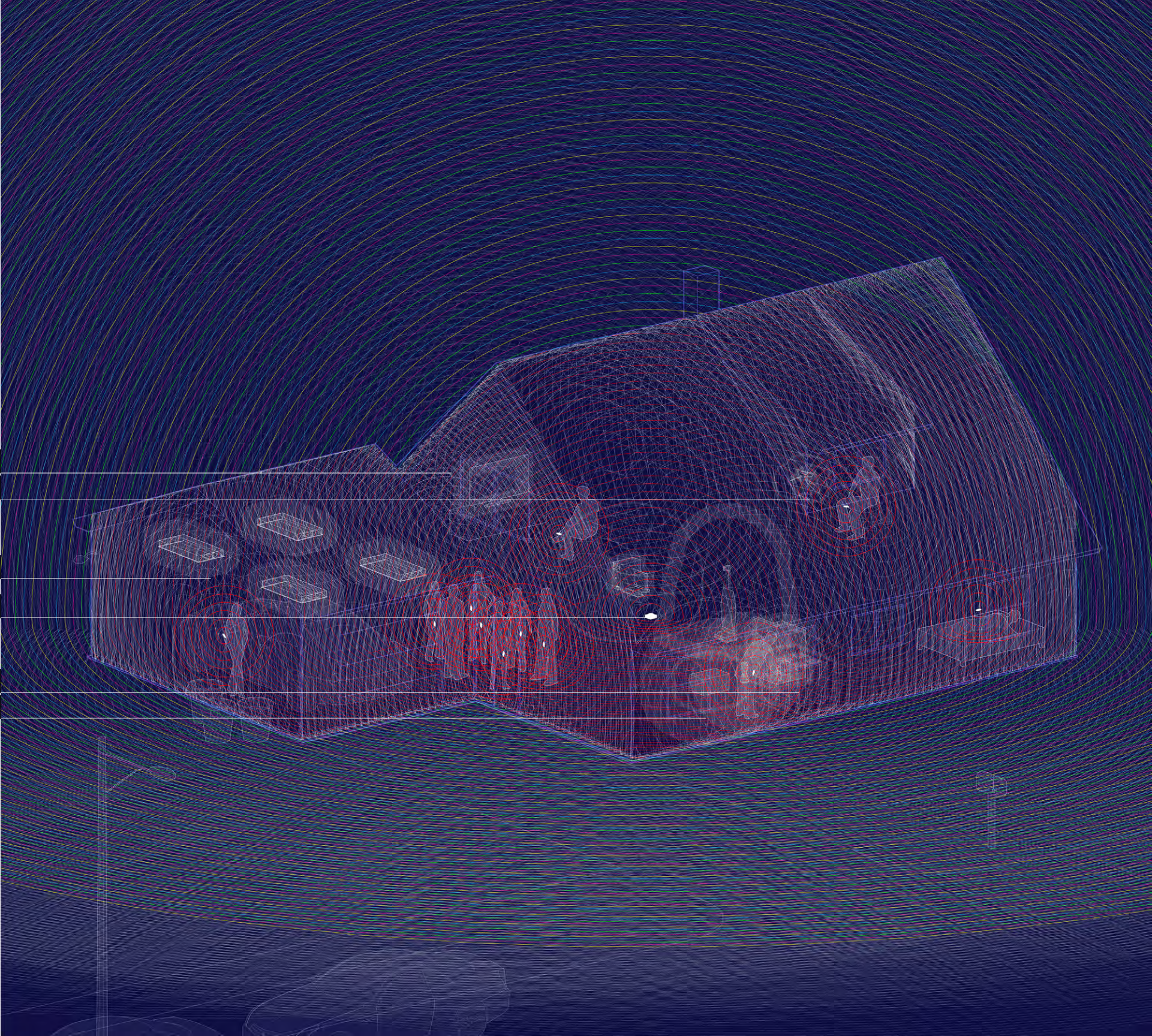
7 μT .

2 μT .

wifi ssid : HOME

4 μT .

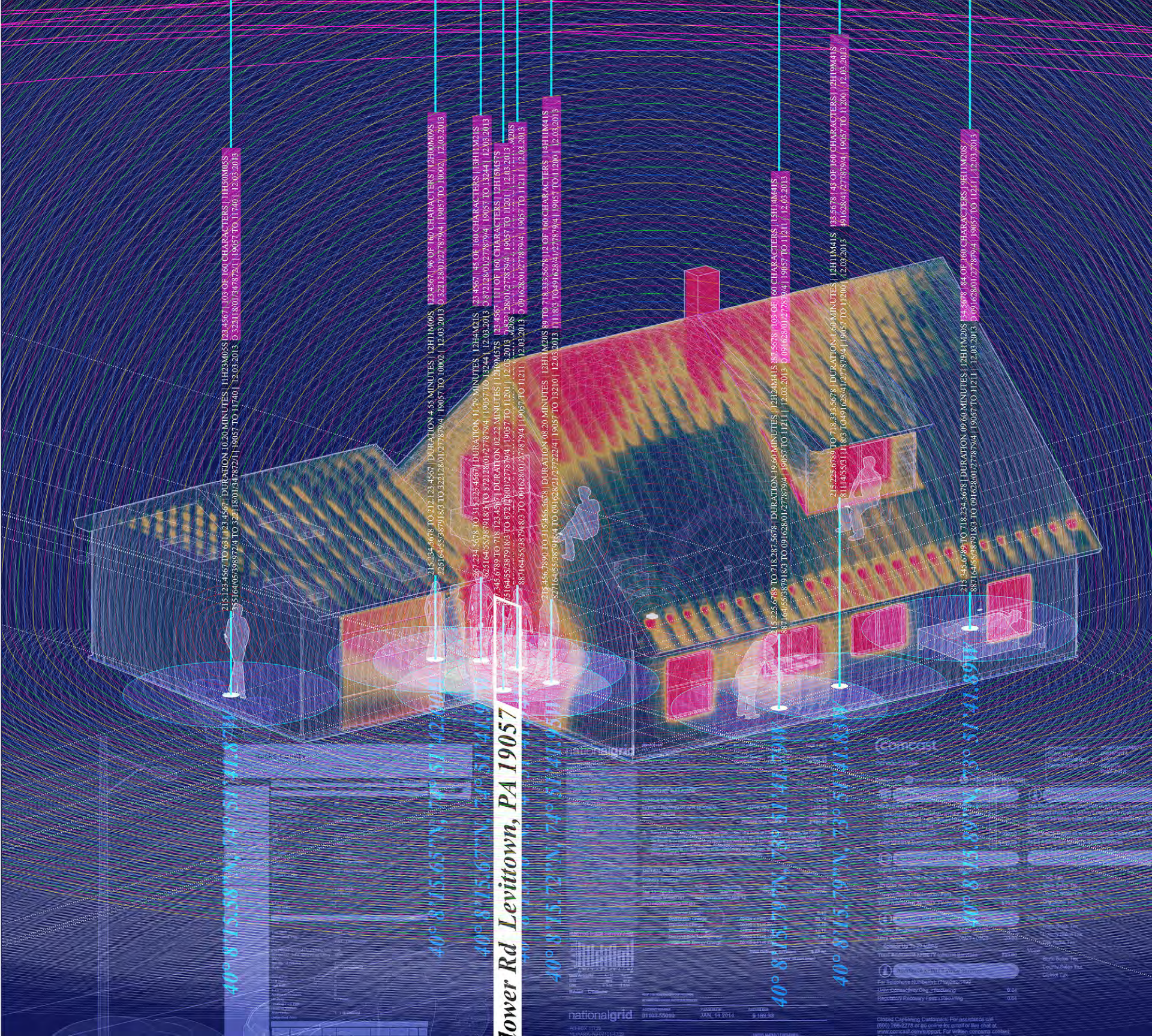
8 μT .



Fantastical Transparency

Through quantifying, measuring, visualizing, and overlaying multiple forms of phenomenal leakage, a synthetic approximation of a space's occupancy is revealed--one that capitalizes on residential architecture's inherent leakiness,

When contextualized within the post-Edward Snowden surveillance state, the ambivalence of the building envelope in perpetuating this fantastically transparent state should be challenged.





III. NSA Pavilion

All NSA Images adapted from “NSA/CSS 60th Anniversary Flipbook”
http://www.nsa.gov/about/cryptologic_heritage/60th/book/NSA_60th_Anniversary.pdf

But hidden beneath the dark reflective finish is the real building, a skinlike cocoon of thick, orange-colored copper shielding to keep all signals—or any other type of electromagnetic radiation—from ever getting out. Known by the code name Tempest, this protective technique, used throughout much of the secret city, was designed to prevent electronic spies from capturing any escaping emissions. Like a black hole, NSA pulls in every signal that comes near, but no electron is ever allowed to escape.

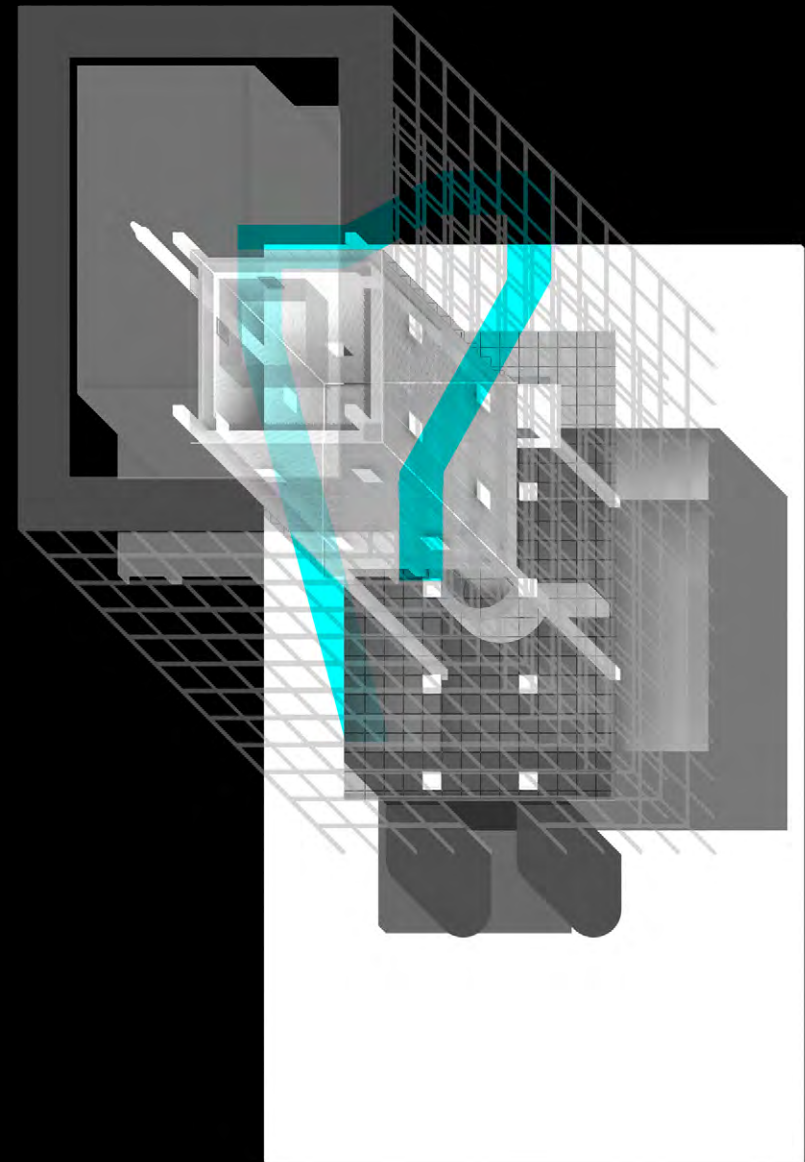
Like the walls, the window through which Hayden was looking that bright December morning was specially designed to prevent eavesdropping. Made of two thick, bullet-proof-style panes, they contained hair-thin copper wires to seal in even the faintest electronic whisper. And to prevent sophisticated laser devices from capturing the telltale vibration of his voice on the glass, music played between the panes.

-James Bamford
The Shadow Factory





Fort Meade
Entry
Fort Meade
National Security Operations Center



Axon, NSA Pavilion



ample HVAC programs air

thick bulletproof glass fortifies envelope

tinted mirrored glass blocks light emission

embedded copper mesh stops rf transmission

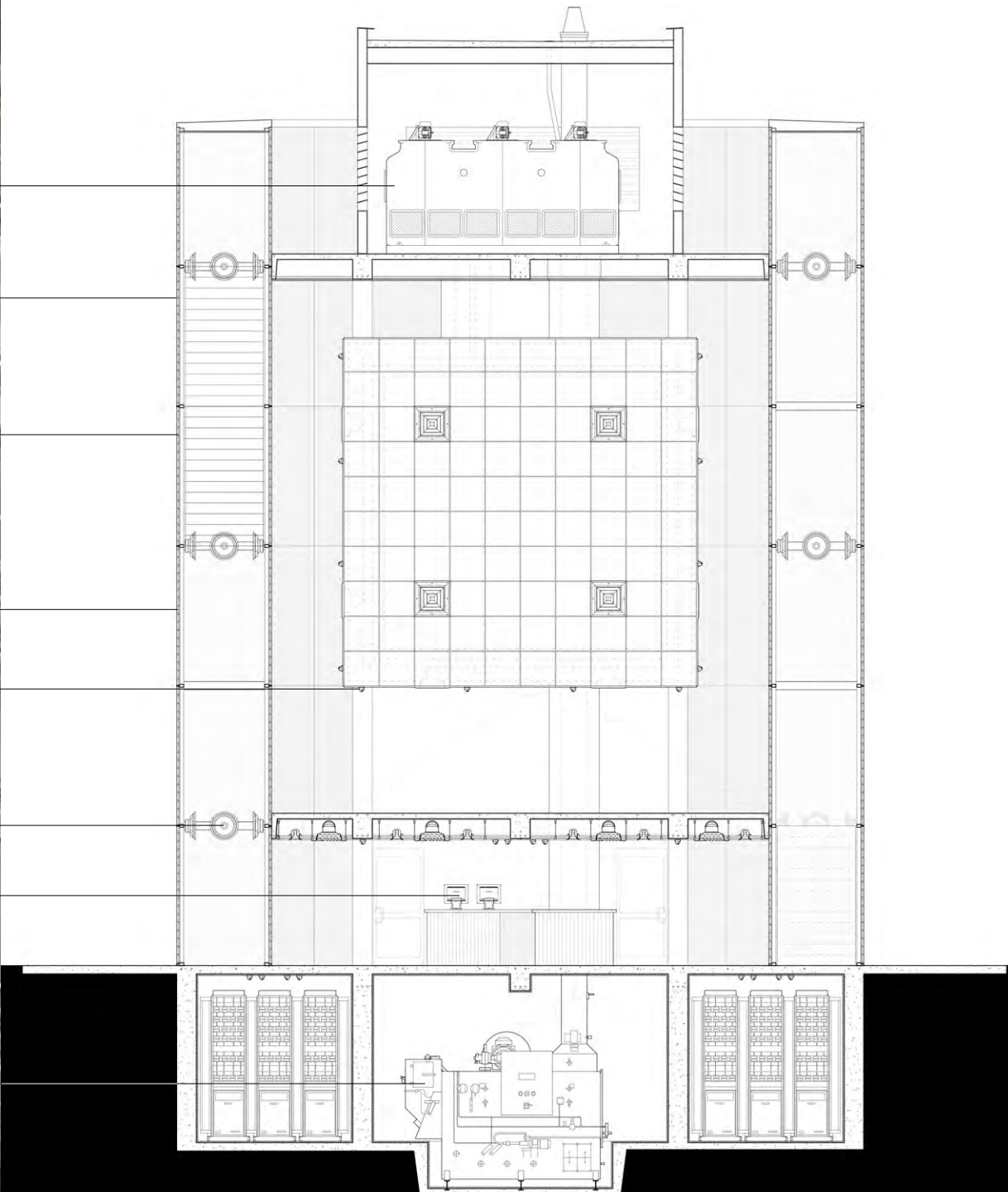
proliferation of security domes manages activity

speakers spoof vibrations of glass

phased perimeter control

incinerator burns waste

Fort Meade
Aerial, NSA Complex



E-W Section, NSA Pavilion

Inside the NSA Pavilion, a member of the NSA Pavilion Police presides over the entrance--allowing only those into the office space above with the proper security clearance.

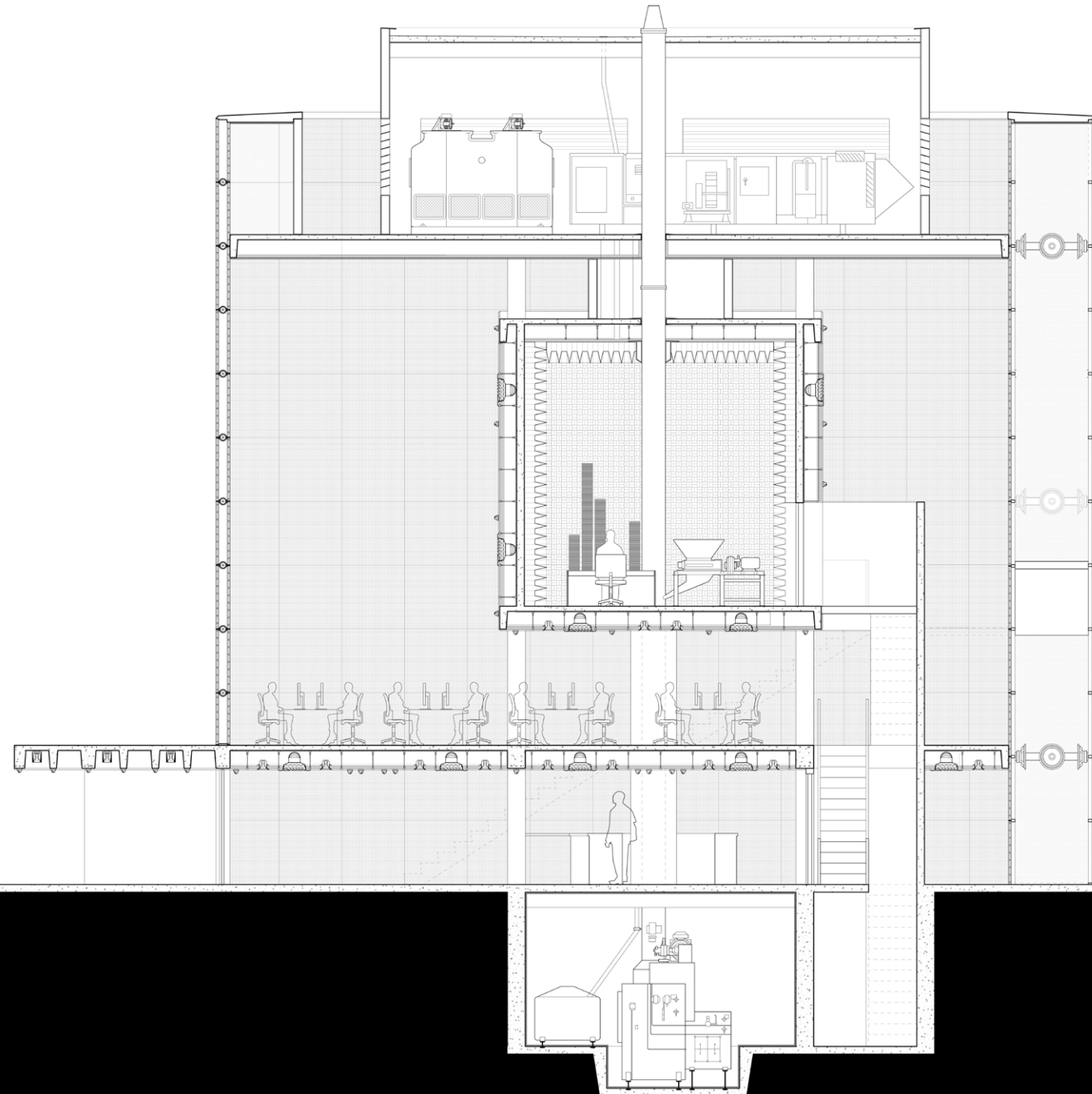
There, they synthesize the metadata of others while the machine they inhabit denies the leakage of theirs.

An informational janitor shreds and incinerates any sensitive or illegal metadata generated within the building's bounds. This gesture perpetually expels white smoke into the atmosphere, itself a metadata of sorts.

The public inhabits the envelope. They peer through the black mirrored glass and copper shielding getting glimpses of the clandestine activities occurring within.

A continuous stair allows for a slow procession to the top as speakers continuously play noise--spoofing the vibrations on glass generated by internal conversation.

At the top, the hum of hidden HVAC units can be heard but not seen.



IV. Strategies for Metadata Management

Stop

Transmissions through the envelope are prevented at all costs. Employing a paranoid material and architectural strategy to eliminate the structure's ability to be synthetically imaged and digitally eroded, the building envelope only accepts that which is required for human occupation and emits that which has been deemed sufficiently banal.

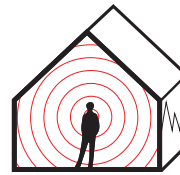
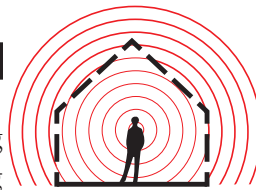
This new existence minimum imagines a future where surveillance mechanisms are omniscient. Privacy is no longer guaranteed by law demanding a bolstered physical boundary between outside and in.

Amplify

Metadata leakage is enhanced and magnified by the building envelope. It leaks phenomenally and perpetually overwhelming would-be surveillors with information quantifying the building in its totality.

Scramble

The building envelope intentionally jumbles and muddles the transmission of metadata creating a grey state of illegibility. The design of the building envelope operates similar to the way the shapes of stealth aircraft are optimized to minimize their informational imprints on radar screens (rather than to optimize their aerodynamic performance).



Spoof

One form of leaked metadata purports to be another. In doing so, the changing forms of visual metadata associated with the house signify something alien. This is similar to the way aberrant structures such as pump houses, urban oil rigs, electrical substations, exhaust shafts, and cell antennae typologically spoof their true program. Often disguised as residences, tall buildings, flagpoles, and trees, they blend into their surrounding context.

Deceive

False metadata will be leaked in order to suggest a specific interior condition similar to the way in timers can automatically turn lights on or off and mail and newspaper delivery can be temporarily stopped to suggest continuous occupation.

Decode

Non visible metadata will be imaged and displayed on the building envelope. Raising awareness as to the ways in which the house can leak, Decode House will be accessible in its candor to the general public.

V. Works Cited

Works Cited

Andreas, Peter and Richard Price. "From War Fighting to Crime Fighting: Transforming the American National Security State," *International Studies Review*, Vol. 3, No 3 (Autumn, 2001): 31-52.

A discussion of how surveillance practices common in times of international war are being transposed and redeployed for use in policing America(ns).

Bamford, James. *The Shadow Factory: the ultra-secret NSA from 9/11 to the eavesdropping on America*. New York: Doubleday, 2009.

Bamford's text outlines the practices of the NSA at Fort Meade in a level of detail previously unknown. Countermeasures embedded in Ops buildings 2A/2B are discussed.

Bergdoll, Barry, and Reinhold Martin. *Foreclosed: rehousing the American dream*. New York, N.Y: Museum of Modern Art, 2012.

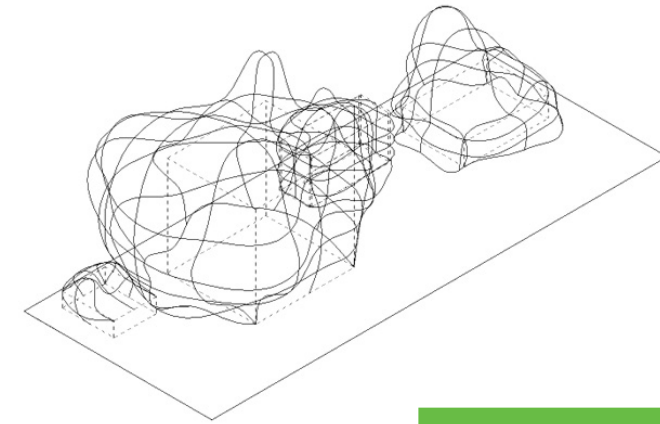
The representational strategies used to reimagine suburbia serve as a model for the graphic development of "Leakiness."

Dunne, Anthony. *Hertzian Tales: electronic products, aesthetic experience, and critical design*. Cambridge, Mass. London: MIT, 2008.

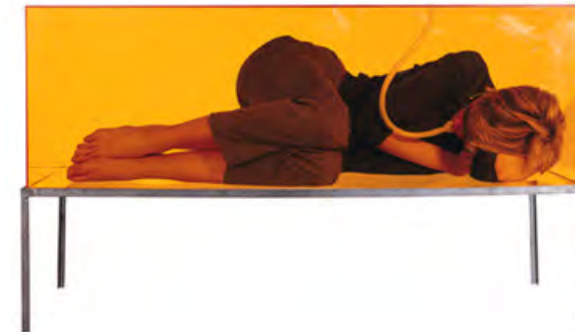
This book explores the ways in which the perpetual and increasing presence of invisible radio waves and electronic communications can pose a new challenge for industrial designers and architects. The need to critical design that operates within this "hertzian space" is increasing especially as a countermeasure to the pervasive and total surveillance of shadowy forces like the NSA.

Fourth Amendment Wear. "Fourth Amendment Wear." accessed December 10, 2013. <http://cargocollective.com/4thamendment/4th-Amendment-Wear>

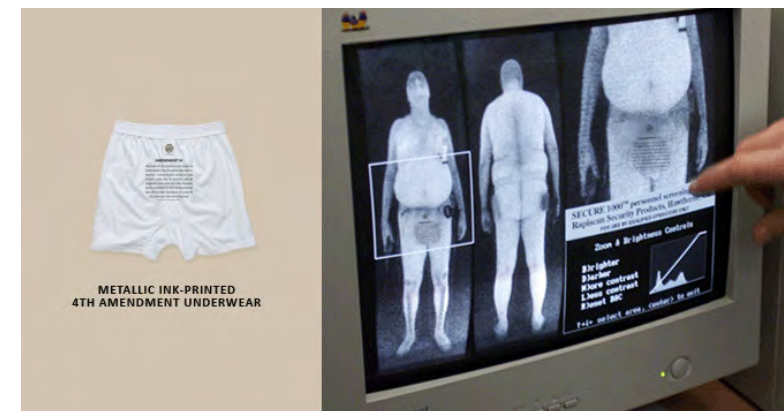
Clothing designed to counteract one's own leakiness while simultaneously provoking a discussion of our 4th amendment rights.



Hertzian Tales
Plotting leaky EM Fields for a telephone, computer, printer and fax machine
<http://www.dunneandraby.co.uk/content/projects/67/0>



Faraday Chair
The Faraday Chair provides shelter from EM fields invading our homes.
<http://www.dunneandraby.co.uk/content/projects/67/0>



4th Amendment Metallic Ink Underwear
The 4th amendment physically constructs privacy that the TSA strips away
<http://cargocollective.com/4thamendment/Metallic-Ink-Underwear>

Freedom from Covert Harassment & Surveillance. "About Us." accessed December 10, 2013. <http://www.freedomfchs.com/id30.html>

Started in 2005, this international conference call group is a community supporting victims of organized stalking, remote electronic assaults, and covert harassment. The website provides resources for 'diy' countermeasures and documents outlining potential ill-effects of electromagnetic and radio overexposure.

Gellman, Barton and Ashkan Soltani, "NSA tracking cellphone locations worldwide, Snowden documents show." The Washington Post, December 4, 2013.

New revelations show that we can be tracked indefinitely through use of our cellphones' metadata.

Hardarson, Ævar. "All Good Architecture Leaks: Witticism or word of wisdom?." PhD diss., Norwegian University of Science and Technology, 2005.


This text examines the building defects and leaks in buildings by architects largely considered to be "good."

Harvey, Adam. "Stealth Wear: New Designs for Countersurveillance." accessed December 10, 2013. <http://ahprojects.com/projects/stealth-wear>

Drones can image the infrared thermal transmissions that we perpetually emit as a form of surveillance. Through employing reflective metallic fabric, this hoodo counters that creating a thermal camouflage

Harvey, Adam. "Off Pocket." accessed December 10, 2013. <http://ahprojects.com/projects/stealth-wear>.

Our cell phones emit traceable metadata even when not in use. Rather than removing the battery to ensure total privacy, the off pocket (a cell phone case with an embedded Faraday cage) can be used to stop these transmissions.

Activity	<p>We begin with a couple of instructional videos from a TI in Oregon, a meditation video for pain management, then a list below of helpful method and items from our community members.</p> 
What You Can Do	
Shielding Tips	
Calendar	
FFCHS Newsletter	
Conference Call List	
Freedom Store	
Donations/Membership	
Videos	
News media	
Documents, etc.	
Testimonies	
Comments	
Petition to Congress	
Activism Materials	

Freedom from Covert Harassment & Surveillance
A 'targeted individual' demonstrates added shielding to his apartment
<http://www.freedomfchs.com/id34.html>



Stealth Wear
Anti-drone garments cloak one's own thermal emissions
<http://ahprojects.com/projects/stealth-wear>

Heat Seekers. “FAQ.” accessed December 10, 2013. <http://www.homeheatseekers.co.uk/faq/>

Operating in similar fashion to google street view, Heat Seekers contracts with local municipalities to complete thermographic imaging on an urban scale with the goal of informing people of the effectiveness of their insulation.

Herscher, Andrew and Brendan Moran, “Monster@thesis.edu.” Paper presented at panel “The Future of the Thesis,” at the Association of Collegiate Schools of Architecture Annual Conference, Portland, Oregon, April 2009.

“Instead of positioning the architectural thesis primarily as either a culminating design endeavor, an opportunity to inculcate the skill of architectural programming, or the chance to find and hone a personal vision or voice, another possibility is available: that of imparting an undergraduate or graduate level fluency, and a nascent expertise, in futurology.”

Kurgan, Laura. Close up at a distance: mapping, technology, and politics. Brooklyn, NY: Zone Books, 2013.

Artist / Architect Laura Kurgan discusses the socio-spatial effects of the transferring of aerial imaging technology from a state of specialized military practice to one ubiquitous public understanding (in the early twenty first century). As such, the way in which aerial maps construct space is biased.

Mann, Steve, Jason Nolan and Barry Wellman. “Sousveillance: Inventing and using Wearable Computing Devices for Data Collection in Surveillance Environments,” Surveillance & Society, Vol. 1, No.3 (2003): 331-355.

This project subverts the practices of surveillance through recursively surveilling the surveillors. In doing so, neo-panoptic space is altered.



Home Heat Seekers Vehicle
Standard vehicle outfitted with thermal imaging equipment
<http://www.homeheatseekers.co.uk/>



Sousveillance
A sousveillance instrument tested in a retail environment

Marx, Gary T. "A Tack in the Shoe: Neutralizing and Resisting the New Surveillance," *Journal of Social Issues*, Vol. 59, No. 2 (2003): 369-390.

Contextualized in the present state of increasing state-sponsored surveillance and an increasing demand for personal privacy, this article outlines eleven maneuvers of evasion. Where these practices focus on the body, I am interested in their potential incorporation into the design of the building envelope to manage phenomenal leakage.

National Communications Security Council, "TEMPEST Glossary," Leaked April 6, 2003 by Cryptome. <http://cryptome.org/0001/ncsc-3.htm>

A glossary outlining government research into countermeasures to emissions security (EMSEC).

Riddell, Jennifer, and Timothy Druckrey. *The art of detection : surveillance in society* ; Bill Beirne, Niels Bonde, Diller + Scofidio, Laura Kurgan, Richard Lowenberg, Steve Mann, Julia Scher. Cambridge, Mass: MIT List Visual Art Center, 1997.

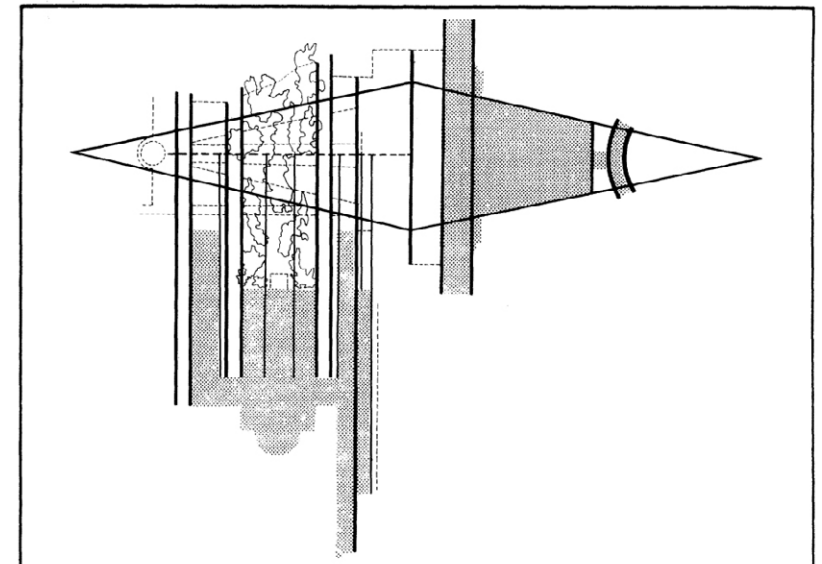
Fundamentally grounded in the ongoing presence of 'institutional surveillance' where practices of security and voyeurism are blended into a state of quasi-omniscience, this exhibition catalog outlines projects that challenge common surveillance practices through the critical engagement of the art installation as a medium.

Rowe, Colin and Robert Slutzky. "Transparency: Literal and Phenomenal," *Perspecta*, Vol. 8. (1963): 45-54.

In creatively misusing the word phenomenal to describe a non-sensorial spatial condition, Rowe becomes the conceptual point from which I depart. Disconnected from the functional implications of his expanded form of transparency, his discussion of literal and phenomenal is wholly ingrained in the disciplinary jargon of architecture.

*"Eleven behavioral techniques of neutralization intended to subvert the collection of personal information are discussed: **discovery moves, avoidance moves, piggybacking moves, switching moves, distorting moves, blocking moves, masking moves, breaking moves, refusal moves, cooperative moves and counter-surveillance moves.**"*

Gary T. Marx
Methods for countering surveillance



League of Nations General Assembly
Spatial stratifications informing phenomenal transparency
As diagrammed by Colin Rowe

Santos, Alexis. "Researchers use Ambient Wifi Radio to See through Walls." Engadget, December, 2012, accessed December 8, 2013. <http://www.engadget.com/2012/08/03/researchers-use-wifi-radio-waves-to-see-through-walls/>.

Using wifi in a way much like radar, subtle changes in intensity are measured allowing a person's location, speed and direction to be determined from behind a brick wall.

The Oyez Project. "Kyllo v. US." accessed Dec 8, 2013. http://www.oyez.org/cases/2000-2009/2000/2000_99_8508

The use of a FLIR thermal imaging device without a warrant is deemed an invasion of privacy. As such, Marijuana grower Danny Kyllo is acquitted. Thus the thermal leakages of our homes are constitutionally protected.

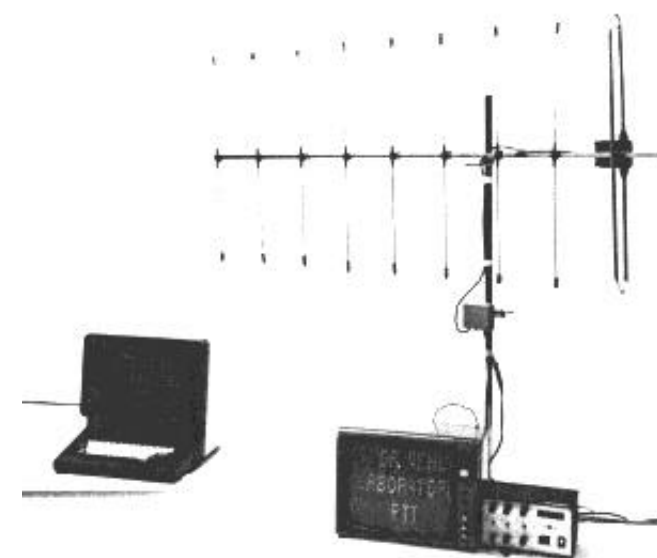
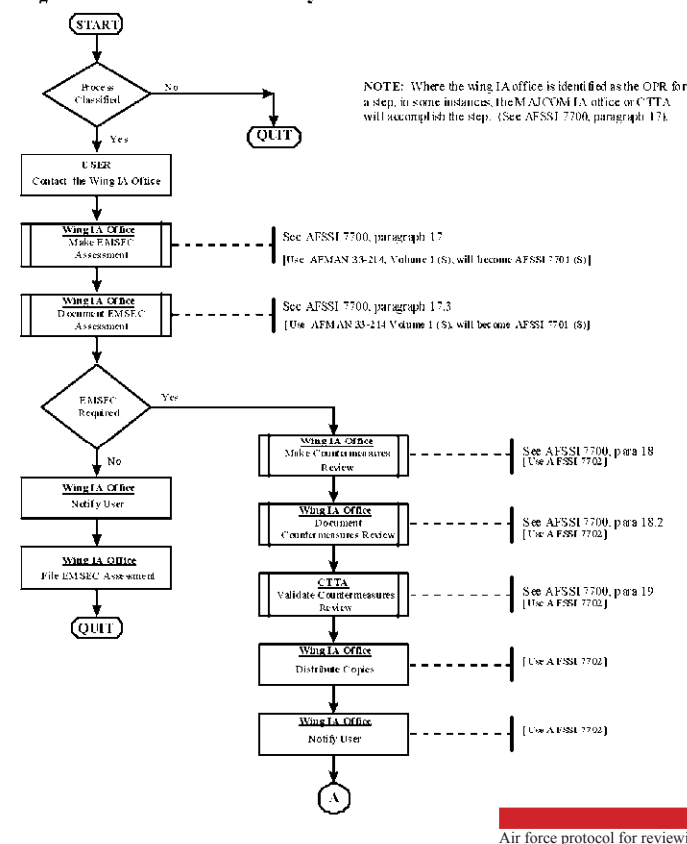
US Air Force, "Air Force Emission Security (Afssi-7700)" Leaked, May 1, 1998 by Cryptome. <http://cryptome.org/afssi-7010.htm>.

This document leaked by Cryptome discusses the implementation of emission security standards called (TEMPEST) in secure air force spaces. Spatial and programmatic separation may be required depending on the level of security demanded by a space. This is a form of radio leakage where secure signals can escape from improperly shielded spatial conditions.

Van Eck, Wim. "Electromagnetic Radiation from Video Display Units: An Eavesdropping Risk?," Computers & Security Vol. 4 (1985): 269-286.

This paper outlines Van Eck Phreaking: a process by which the unshielded radio emissions of displays and keyboards can be measured and recreated without any physical connection.

Figure A2.1. The Emission Security Flowchart.



Van Eck Phreaking Rig
The picture on the TV is picked up from the radiation of the VDU in the background

Vishmidt, Marina, and Boris Grojs. *Uncorporate identity*. Baden Maastricht: Lars Müller Jan van Eyck Academie, 2010.

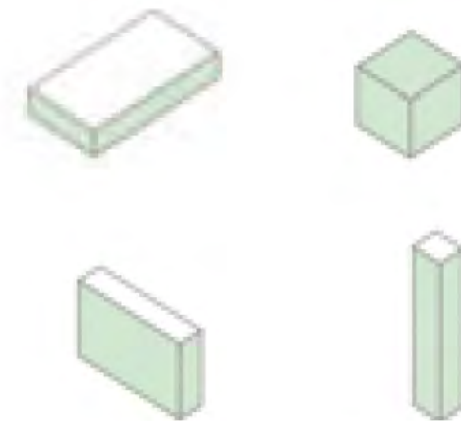
Metahaven's work on issues of visual identity ranges from the fantastic to the plausible. Examples describing the gap between the physical micronation and its requisite digital online presence is useful for me in conceptualizing methods of representation and analytical frameworks for my study of building metadata.

Zaera-Polo, Alejandro. "The Politics of the Envelope," *Log*, No. 13/14, *Aftershocks: Generation(s) since 1968* (Fall 2008): 193-207.

Rather than engaging with the envelope as a physical boundary, Zaera-Polo's treatise attempts to politicize the building envelope as a typological function of its overall shape.

Zoom In Op Uw Dak. "Thermographische Kaart." accessed November 6, 2013. <http://zoominopuwdak.antwerpen.be/>

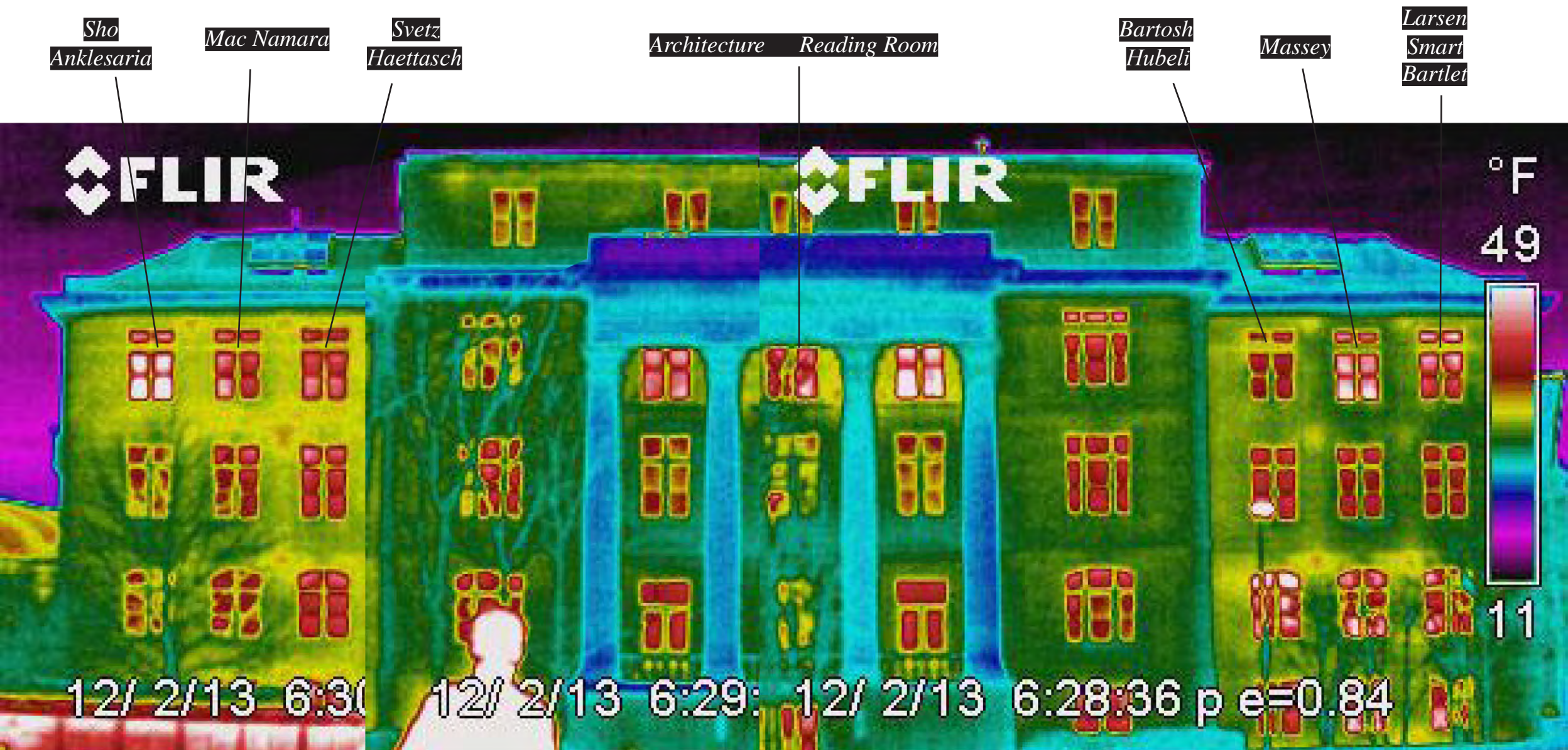
In 2009 a group of municipalities in Belgium mounted a thermographic camera to a plane and flew it over Antwerp in order to visualize thermal leakiness at an urban scale. The resulting thermographische kaart (thermographic map) is the largest publically available database of thermal imagery.



The four types of envelope
Flat-horizontal, spherical, flat-vertical, and vertical
As theorized by Alejandro Zaera-Polo



Thermographische Kaart
City-sponsored Aerial thermography in Antwerp
http://infoethetics.com/archives/2010/07/zoom_into_your_roof.html



Geospatial imaging capitalizes on all forms of architecture's leakiness

above: FLIR Thermography annotated with occupants' names, Slocum Hall, Syracuse, NY. Image by author, December 2, 2013

Vice Admiral Robert Murrett, Ret.

Deputy Director, Institute for National Security and Counterterrorism, Syracuse University

4th Director of the National Geospatial Intelligence Agency

Adapted from interview, 10.21.2013, Syracuse, NY

VI. Leaky Pavilions

As a matter of design, these structures operate on the leaked visible, non-visible, and distant metadata generated incidental to our occupation of buildings. The pavilions ultimately probe similar sets of conditions, each conveying a radically different envelopic tone. Whether stopping, amplifying or dampening, they seek to effect a measurable change cloaking the metadata leaked from within.

Visualized primarily in their surveilled states, their designed leakage is amplified.

01_Stop

Transmissions through the envelope are minimized. Employing a paranoid material and architectural strategy to eliminate the structure's ability to be surveilled, the building envelope only accepts that which is required for human occupation and emits that which has been deemed sufficiently banal.

02_Amplify

Metadata leakage is enhanced and magnified by the building envelope. It leaks phenomenally and perpetually—overwhelming would-be surveillors with information quantifying the building in its totality or falsely emitted metadata.

03_Dampen

The building envelope intentionally muddles the transmission of occupational metadata creating a grey state of illegibility. Metadata is made equal in intensity, blending in with the building's urban surroundings or disassociated from its true intensity.

Stop_Operative Strategies

Block:

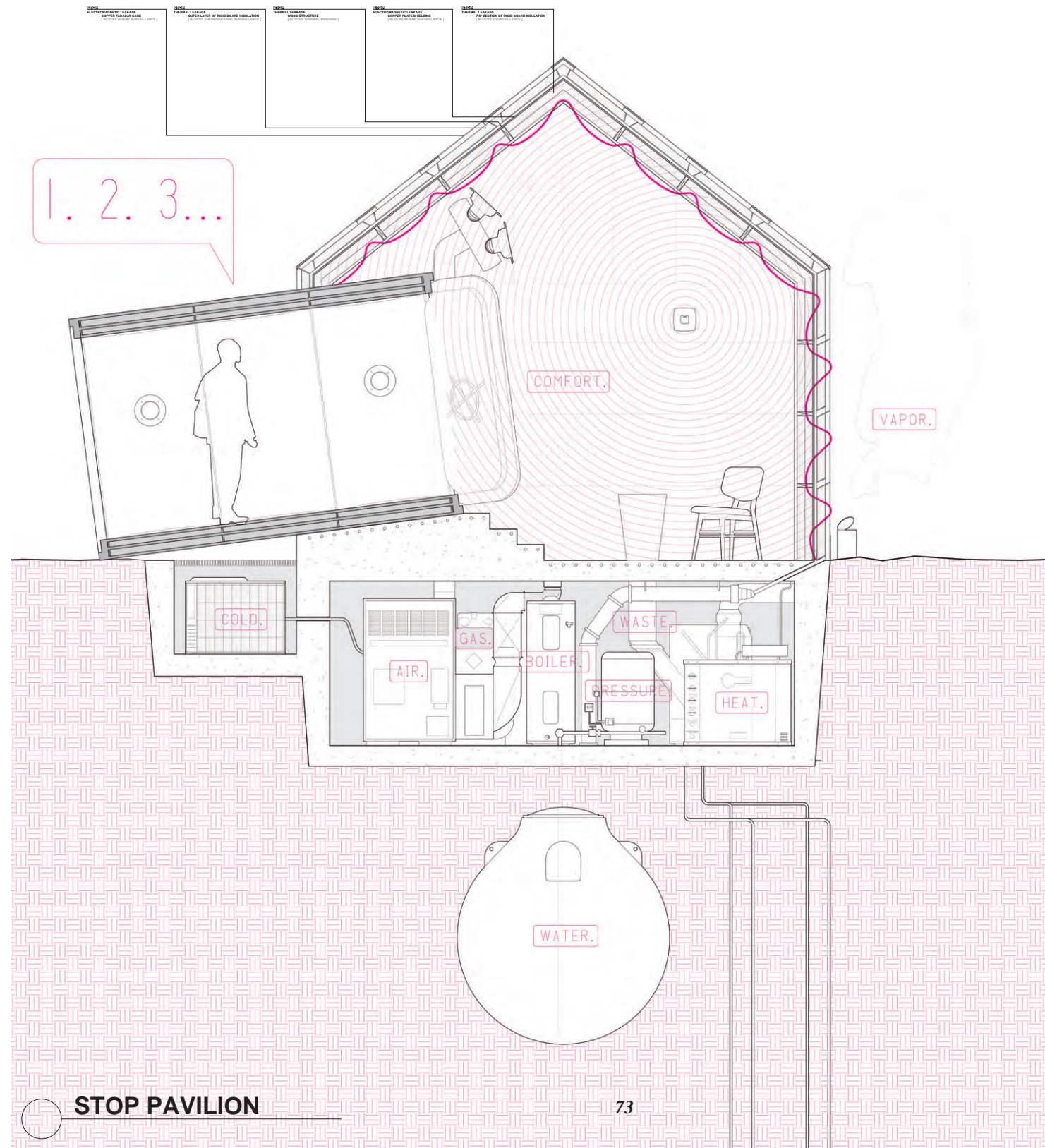
- Dense materials (lead and copper) shield electromagnetic and radio frequencies.

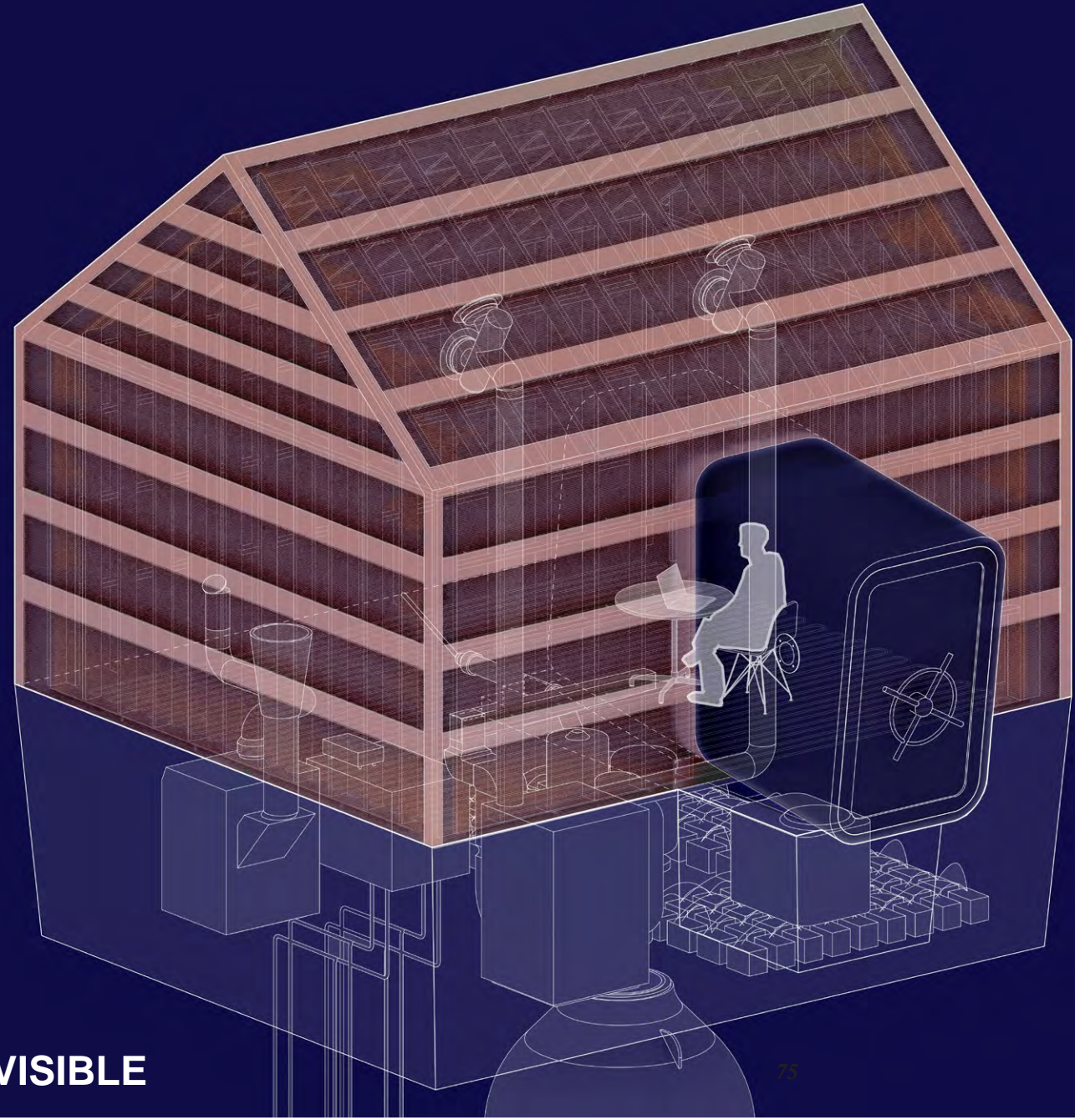
Suspend:

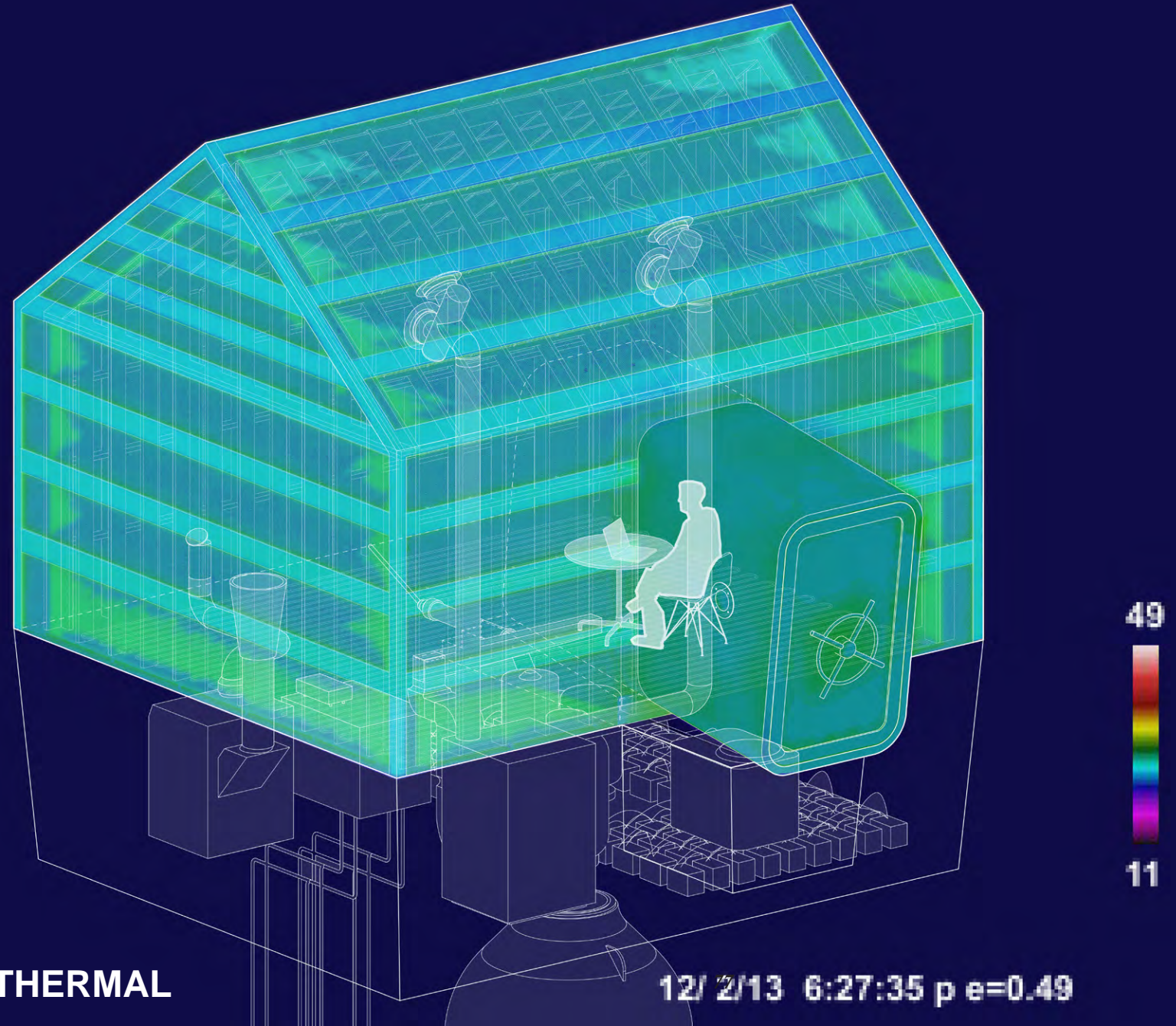
- Utility use is suspended by disconnecting from the grid. The building is entirely powered by concealed renewable systems.
- Mail is delivered to an offsite location. It is read and securely transmitted to the house digitally.

Minimize:

- Thick section of board insulation minimizes thermal leakage and maximizes R value.
- Non-metal construction prevents heat-bridging
- Air leakage is stopped. A decompression chamber minimizes uncontrolled exchange of outside air.









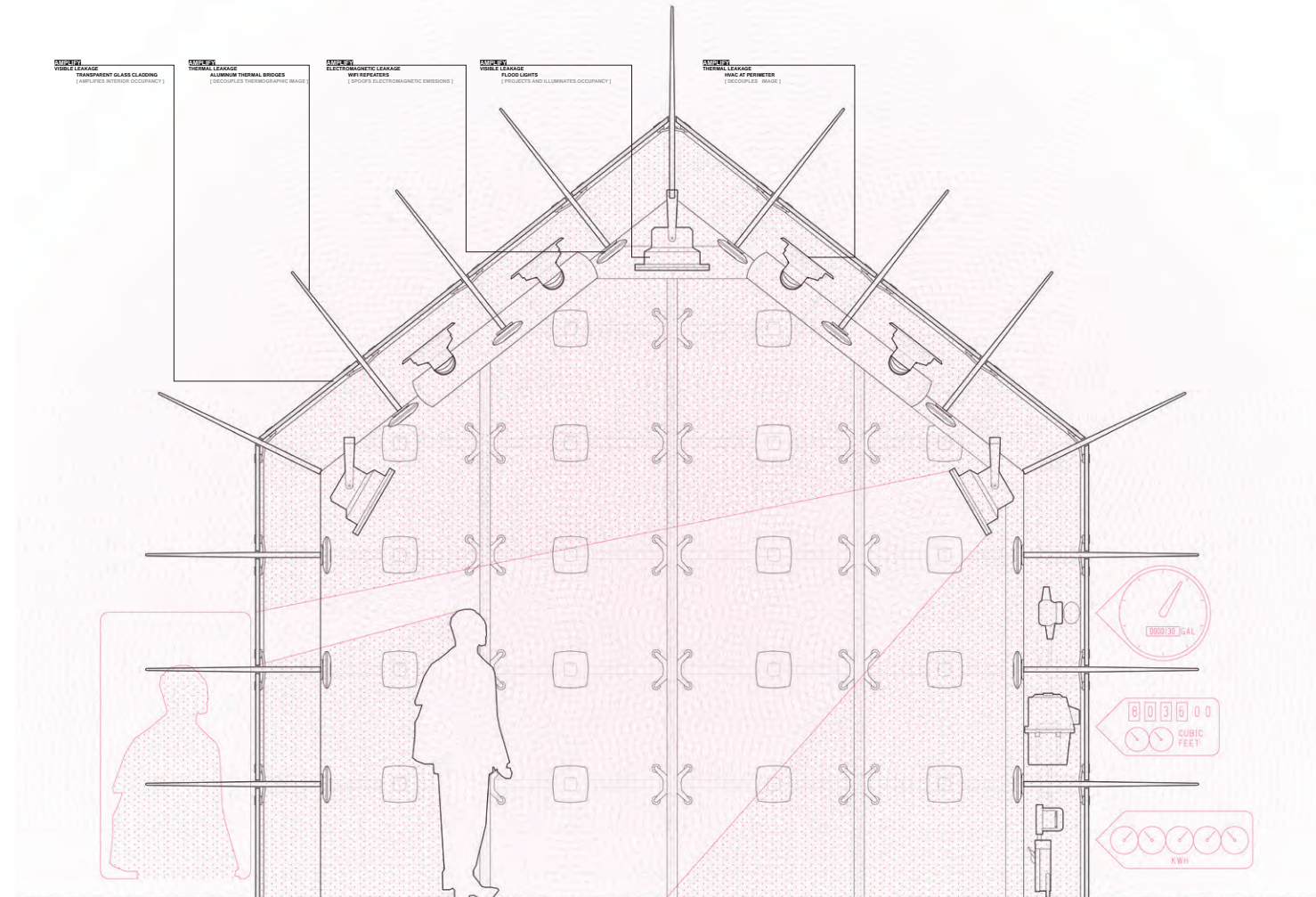
Amplify_Operative Strategies

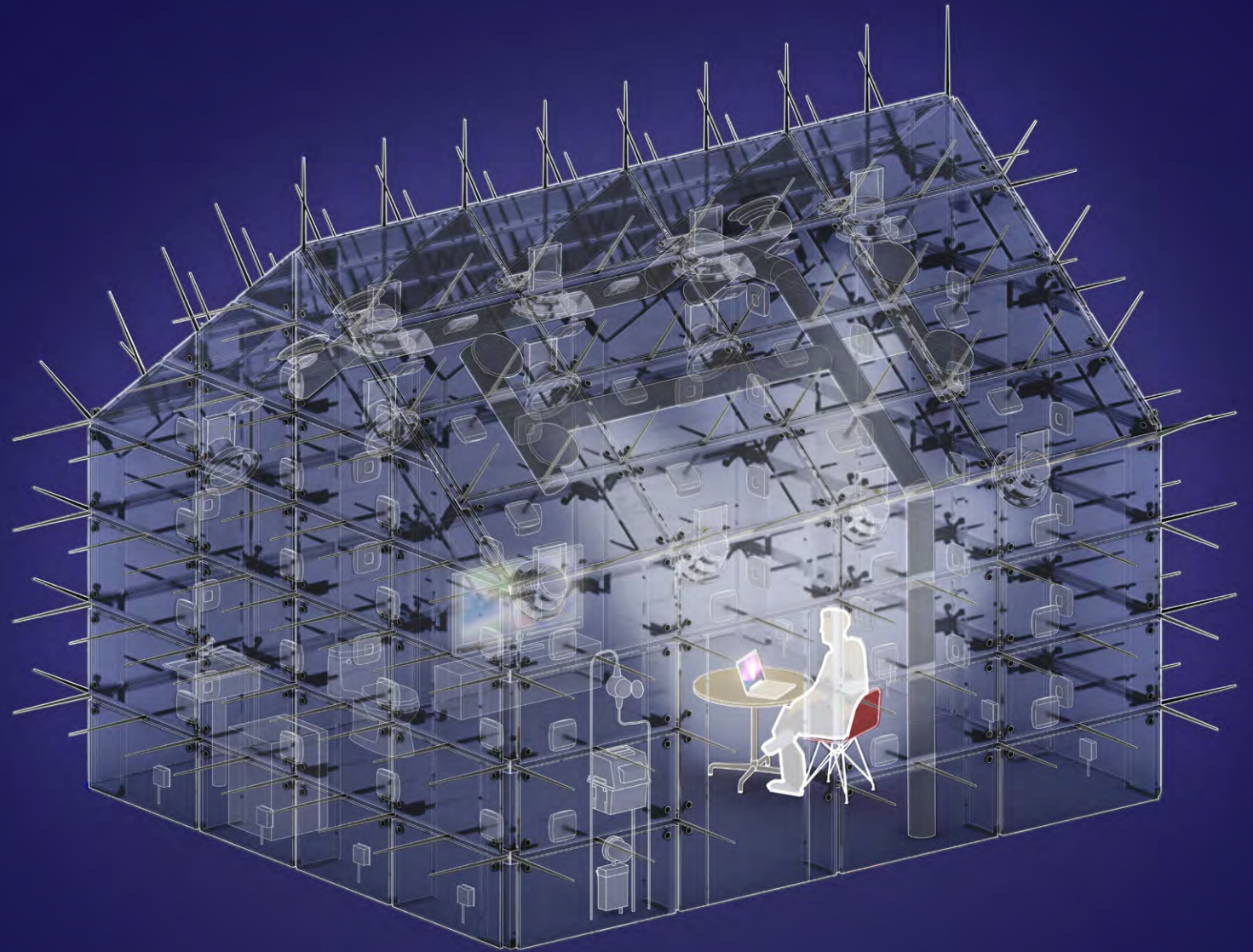
Transparency:

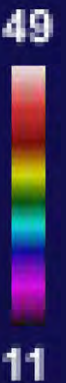
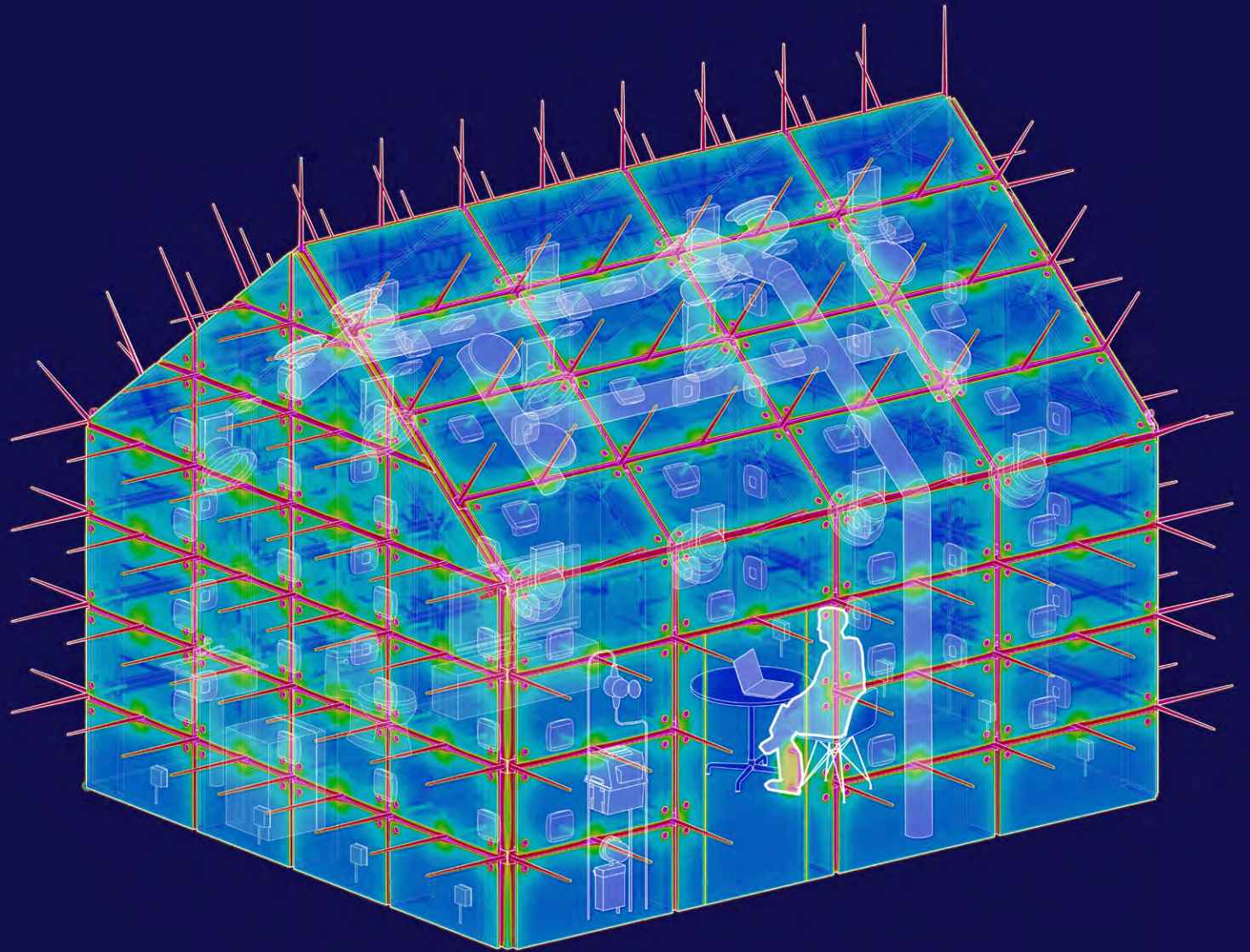
- Materials such as glass and plastics allow for visual transparency allowing a heightened reading of information quantifying the building's interior (i.e. light, activity, occupancy).
- Through material choice, electromagnetic interference is minimized.
- Purposefully loose construction allows for heated air to perpetually escape.
- Exaggerated thermal bridges passively promote thermal leakage at the site of the building envelope.
- Refuse is automatically documented and made public.
- Mail is automatically documented and made public.

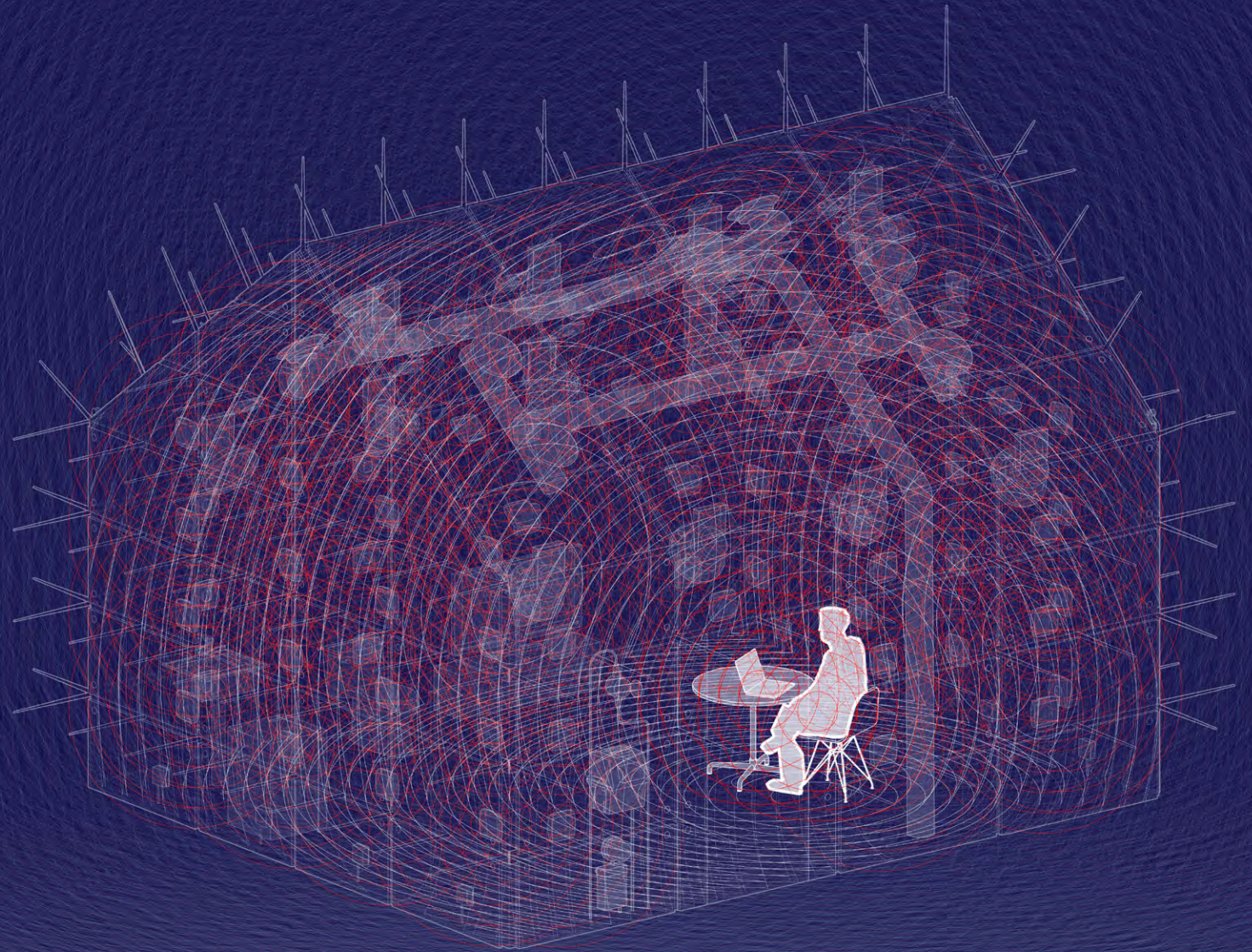
Forced / Re-mark:

- Interior conditions (temperature, WIFI / RF / EMF levels, light levels, etc.) can be measured by mechanical means and subsequently recreated and amplified.
- Shadows are projected onto the building's envelope—collapsing interior occupancy onto the building's elevation.









Dampen_Operative Strategies

Transparency:

- Materials such as glass and plastics allow for visual transparency allowing a heightened reading of information quantifying the building's interior (i.e. light, activity, occupancy).

Spoof:

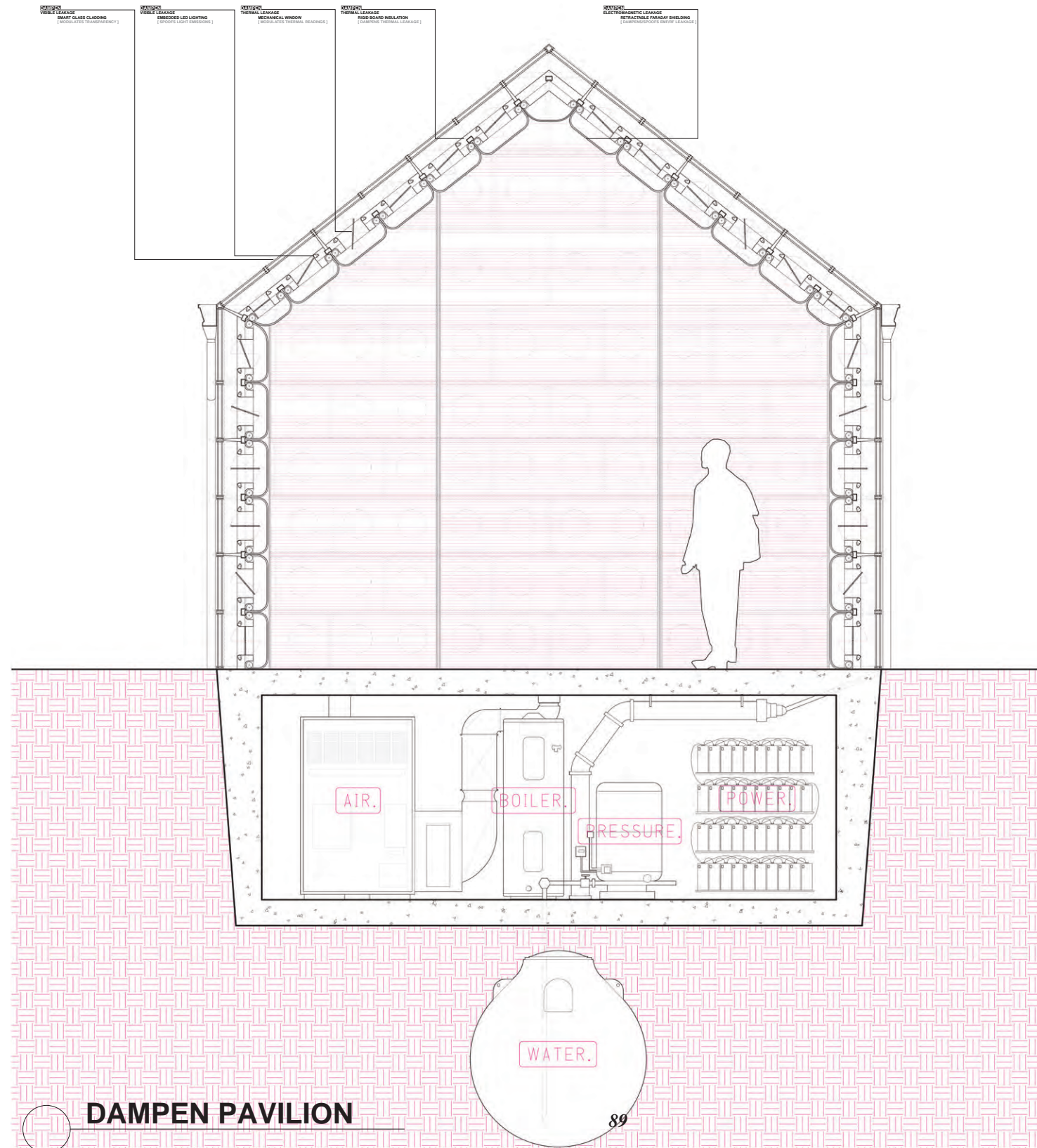
- A second skin muffles the true metadata leaked from the first decoupling the building's surveilled appearance from its true interior activities.

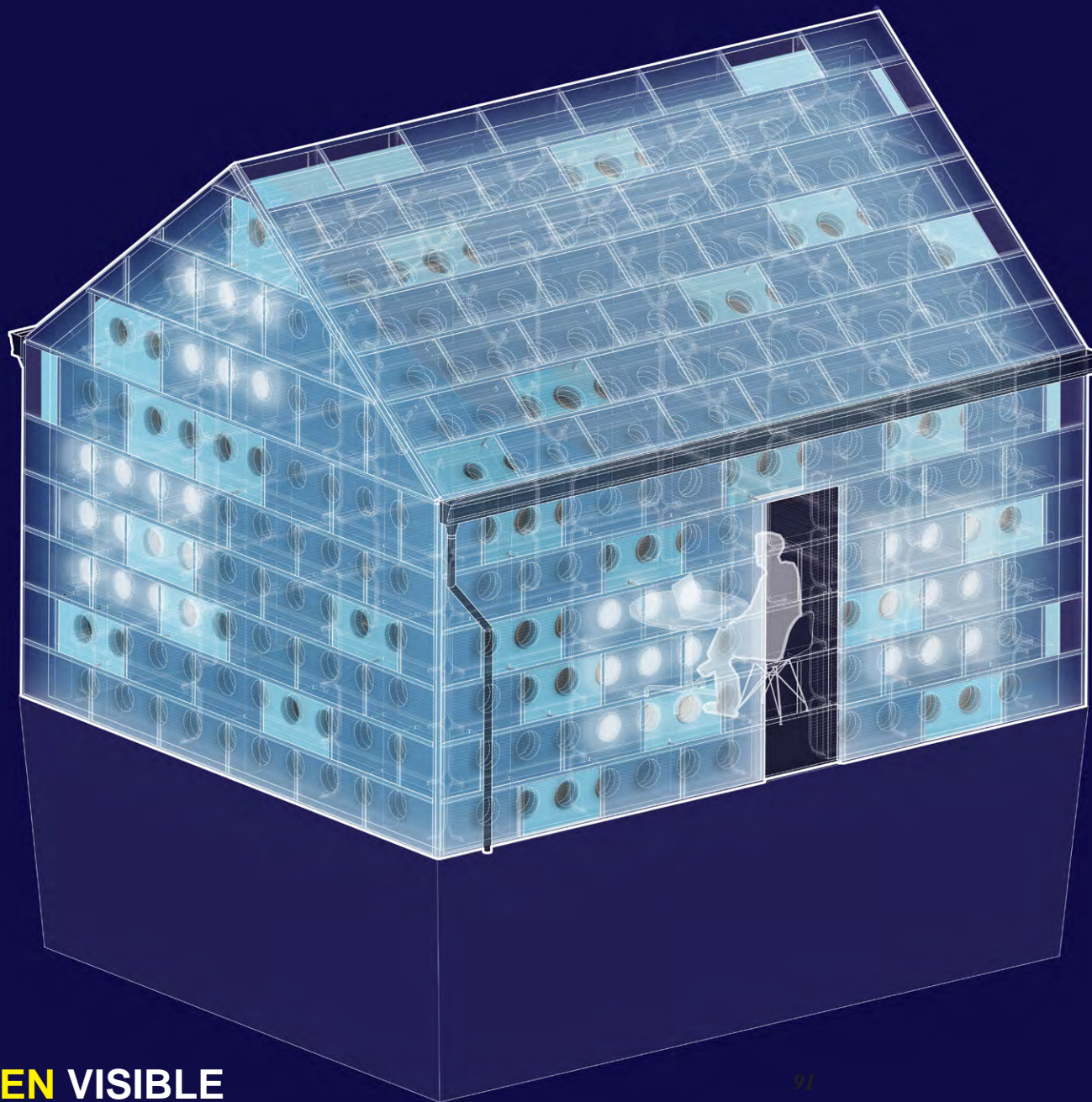
Average:

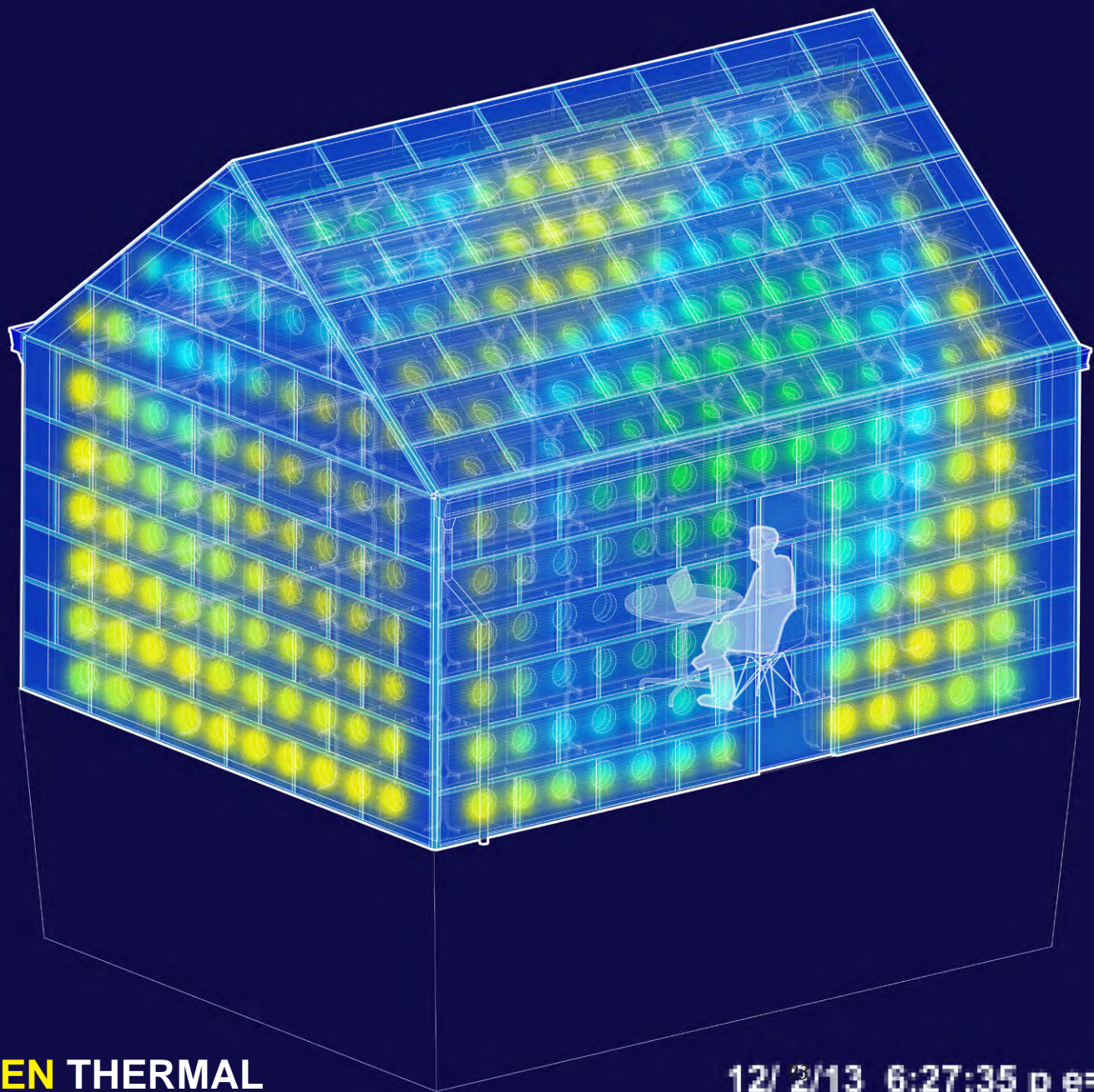
- A second skin modulates light selectively leaked by the building's first skin.
- Utility use is neutralized, dampening it relative to the neighborhood's monthly averages.
- Utility use is averaged. Every month the house draws the same amount from the grid.

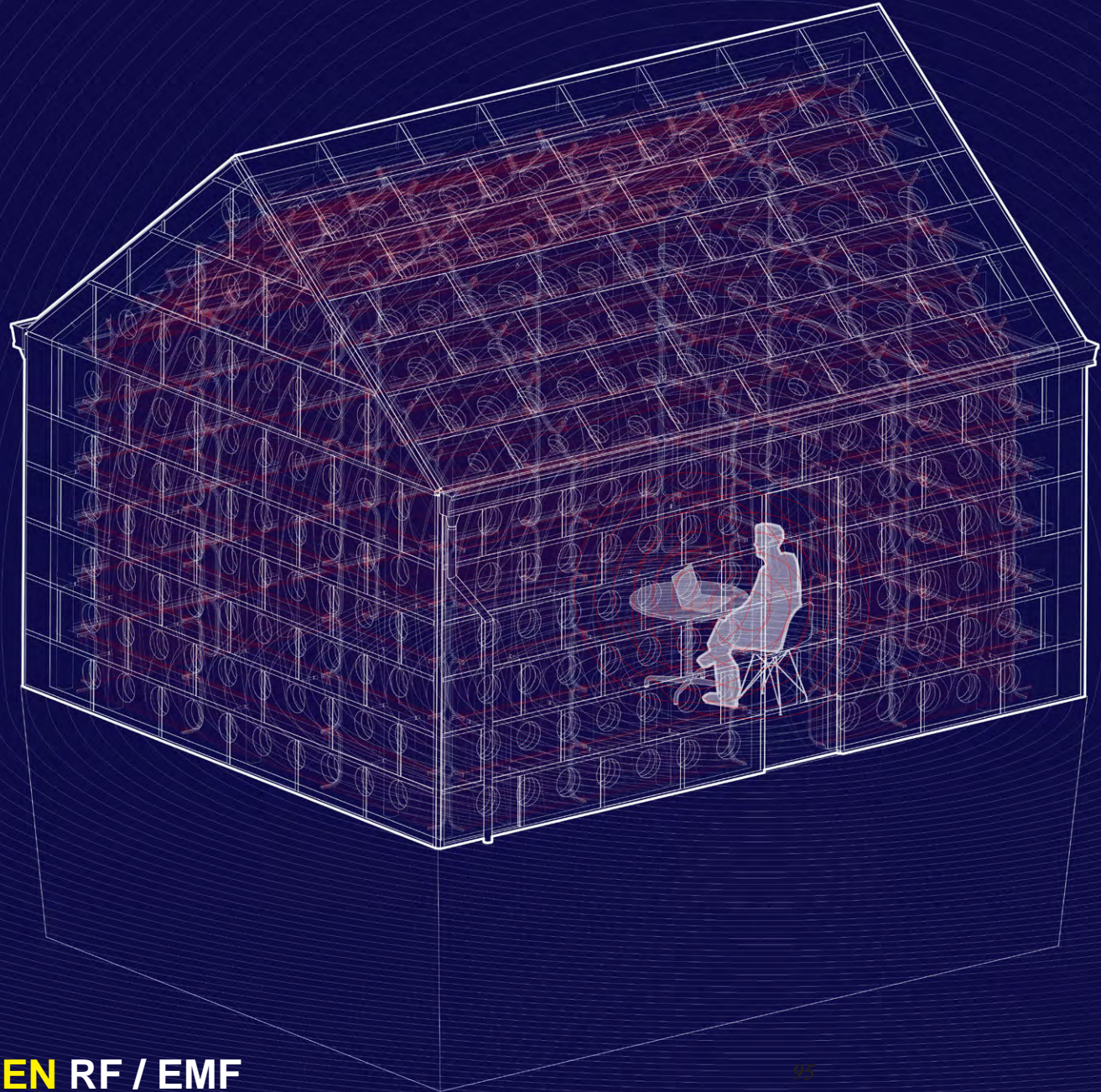
Mask:

- In order to mask variation in utility bills, concealed renewable resources kick-in once the average amount of electricity, gas, and water is drawn from the grid.









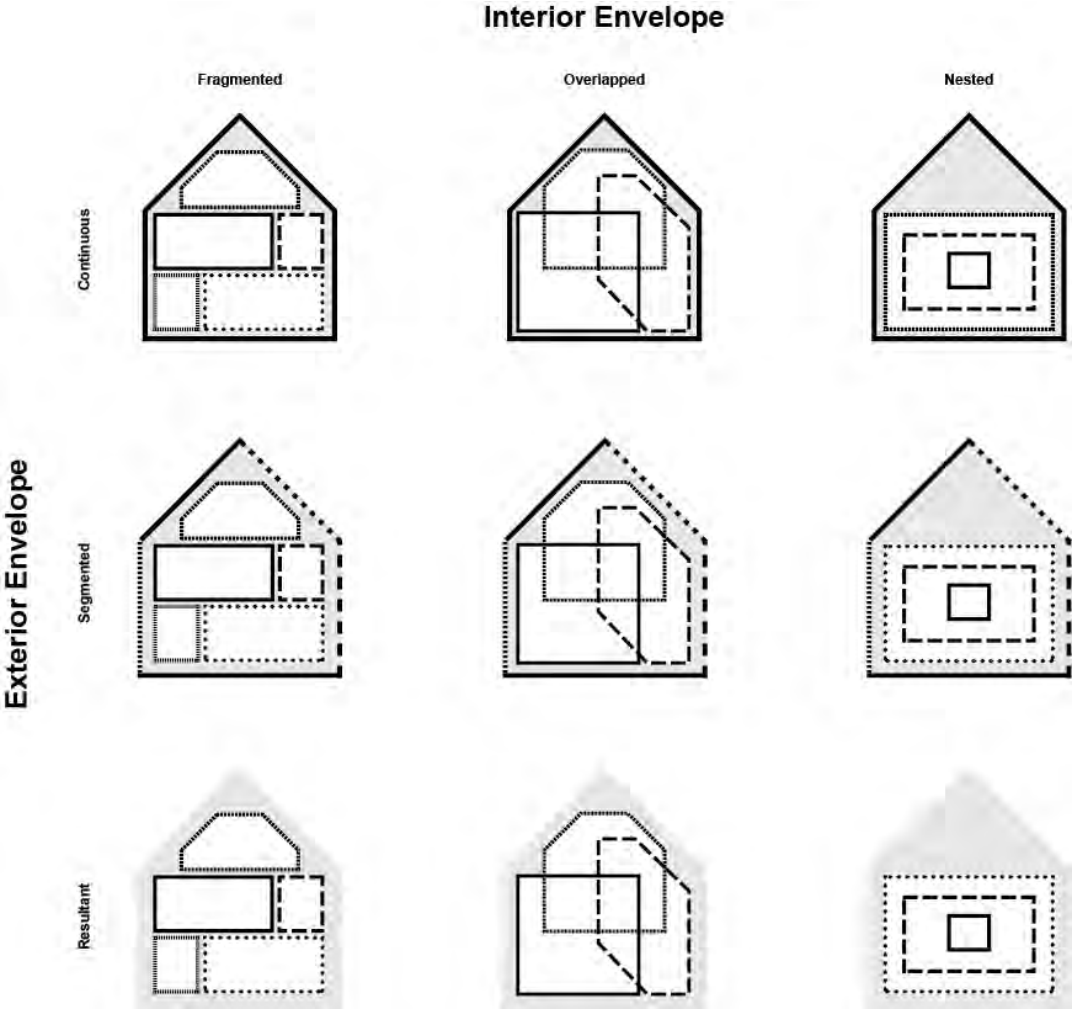
VII. Privacy Parade



Tempered by recent revelations documenting the extent of the NSA’s domestic surveillance activities, we can imagine a future where the privacy constitutionally assigned to the home is challenged. In the near future one can imagine the need for a house able mask, deceive, and shield our informational emissions without necessarily stopping them absolutely.

Where square footage, economics, and architectural style were the primary criteria by which returning vets and their new families selected their Levittown abodes, their great-grand children will select their own SuperHouse based on issues of privacy, security, and ‘leakproofness.’ Existing as a new suburban typology, these five homes represent explorations projecting architecture’s role in managing personal and familial privacy needs. Combinations of three distinct architectural strategies are employed at the building envelope intending to subvert architecture’s inherent leakiness and strategically minimize its surveilability.

Currently, only those engaged in aberrant activities on the fringe of legality perform such evasive measures by visually altering the public appearance of their homes—keeping up appearances as to not raise suspicion. But in a world where surveillance can effectively make the home transparent, the metadata quantifying our banal residential activities needs to be consciously managed by architecture.



Rather than focusing on the newest aesthetic and lifestyle trends associated with residential interior design, this ‘parade of homes’ showcases the envelopic nature of privacy crafted by a leak-conscious architecture.

As a series, these model homes represent how acknowledgment of and response to architecture’s inherent leakiness can respond to divergent privacy desires.

Formally, they seek to amplify the envelopic nature of privacy by different typological means. The envelope becomes both an exterior and interior condition that manages intra-house and inter-house privacy.

Conceptually set in McLean, Virginia in close proximity to the US surveillance apparatus scenarios of their occupancy serve to inflate their plausibility.



House 1

Designed for the average Joe, House 1 responds to generic privacy concerns that pit contemporary expectations of connectivity against privacy.

Interior:

Its continuous interior envelope uniformly provides static visual and electromagnetic shielding. Shrouded in a faraday cage, emissions from this protected zone are minimized.

- Standard platform frame construction visually shields bedrooms, restrooms and the kitchen
- A copper mesh faraday cage blocks emissions and modulates the view out

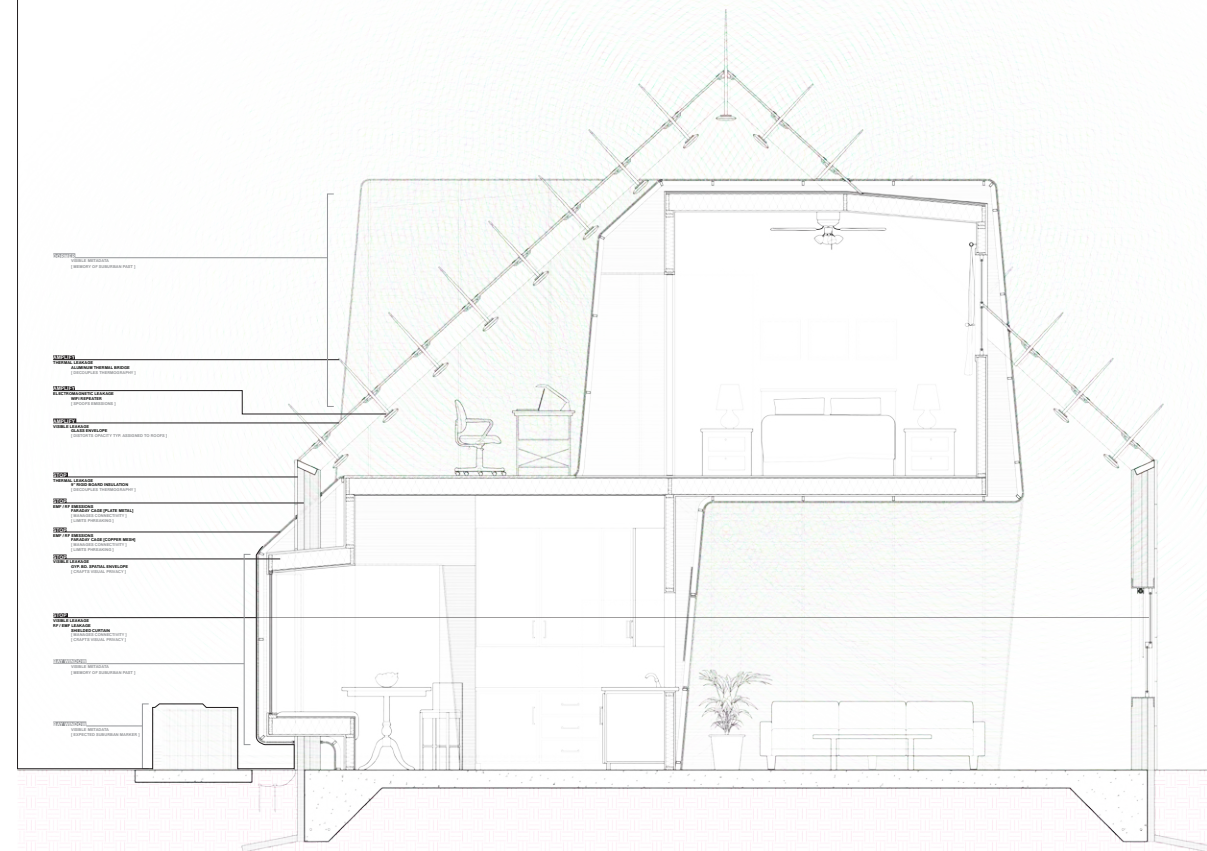
Exterior:

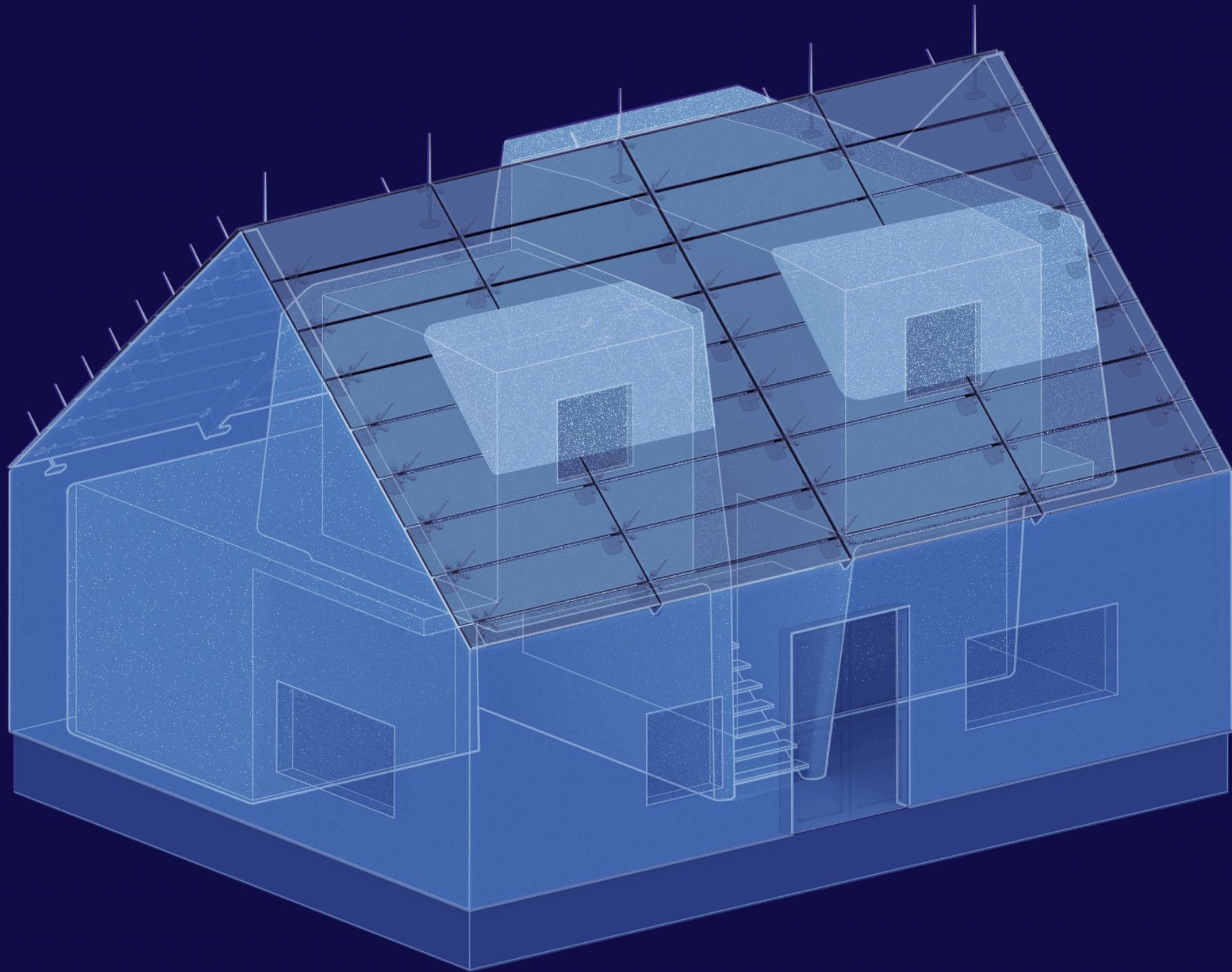
Its segmented exterior envelope actively spoofs and screens emitted signals generated by activities occurring in the interstice of the two envelopes.

- Faced with copper mesh, a thick section of rigid board insulation, and embedded sheet metal faced with copper mesh, the exterior envelope blocks leaked metadata totally (save for punched windows mechanically shielded by an interior curtain)
- A transparent roof allows light and view into the house while wifi repeaters and thermal bridges decouple its surveilled appearance from its visual presence

Form:

Possessing a Levittown-like formal envelope, affectations signifying interior activity are kept to a minimum. Memories of distinctly residential architectural metadata occur when the interior slips past the exterior, generating protrusions reminiscent of a dormer or a bay window.





House 2

House 2 responds paranoically to the fringe privacy concerns of the tin foil hat-wearers and targeted individuals who demand total isolation.

Exterior:

Providing visual and aural shielding, the exterior envelope denies view into the house by day and minimizes light leakage by night

- Four similar mirrored glass facades visually shield the interior while non-conductive louvers on the roof deny the view in from above.

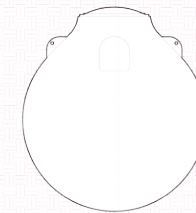
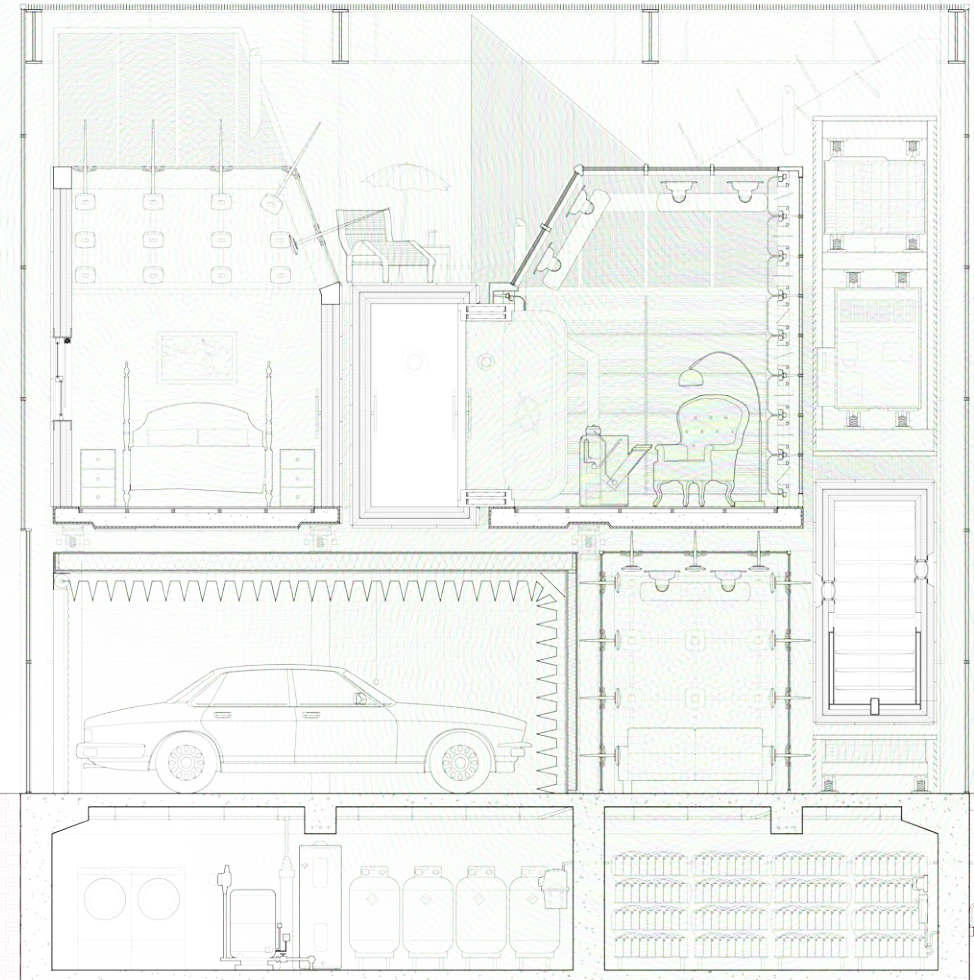
Interior:

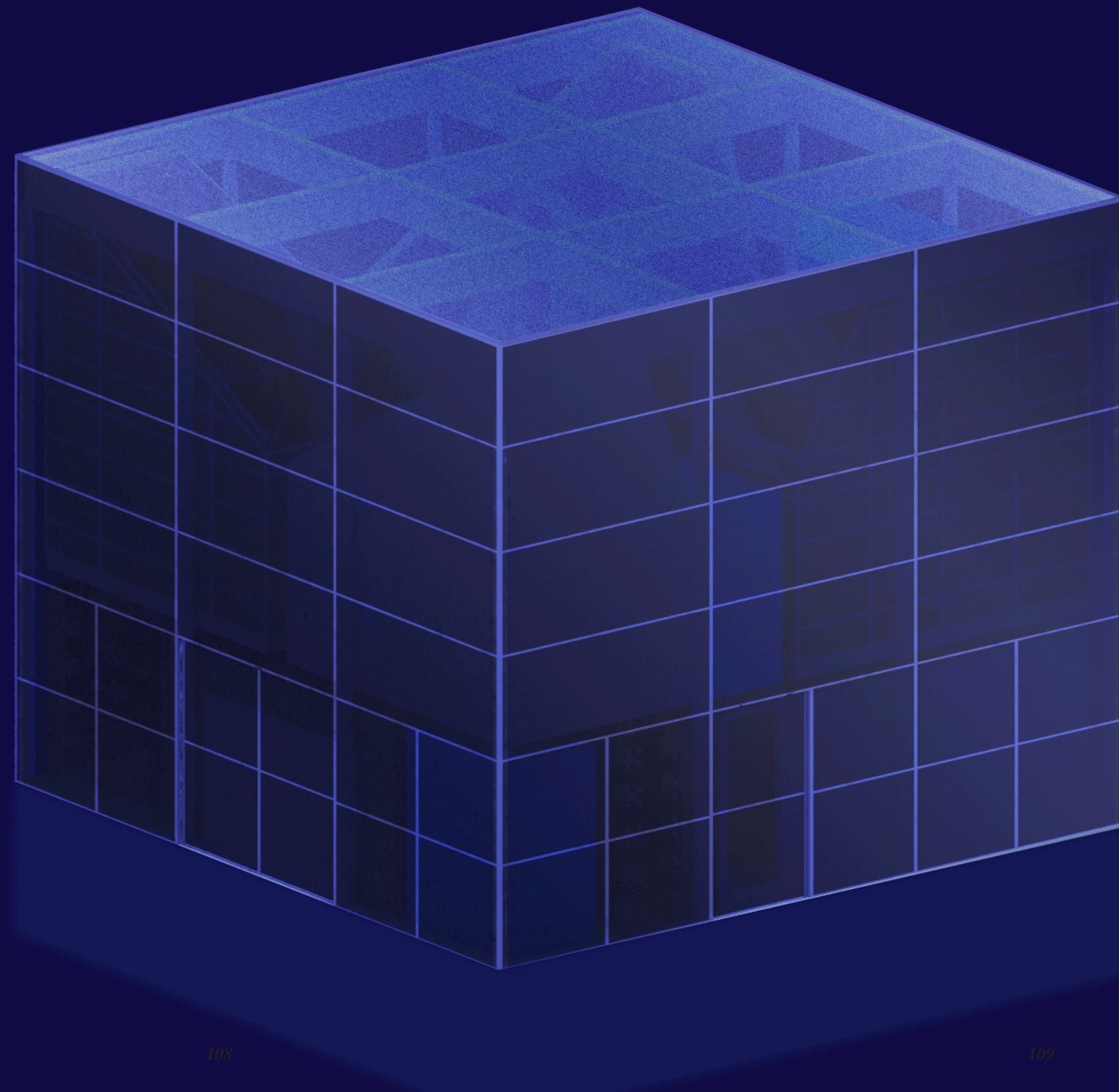
Like a balloon frame house that renders adjacent rooms 'pressurized' and isolated from each other, this house's hyper-fragmented interior provides total air-gapped insulation for its inhabitants.

- A myriad of isolated interior envelopes fragment the social order of the home.
- An air-locked circulation spine ensures the spatial isolation of each leaky space
- The public zones of the house become radically leaky, so as to spoof adjacent spaces
- Each bedroom generates a privacy distinctly tailored to the needs of its inhabitant.
- Independent vibration-dampened mechanical systems power each space—affording total environmental separation.

Form:

Seeking to decouple its form from its residential program, this house minimizes markers of domesticity such as the pitched roof, the casement window, or the garage door--becoming a platonic cubic volume sited inconspicuously on the suburban landscape.





House 3

House 3 responds to the privacy needs of a paranoid journalist who needs to assure displacement while pursuing stories that skirt the limits of free speech.

Form:

A singular banal house-like volume devoid of overtly domestic formal affectations serve to minimize phenomenally transparent programmatic readings of its interior.

Interior:

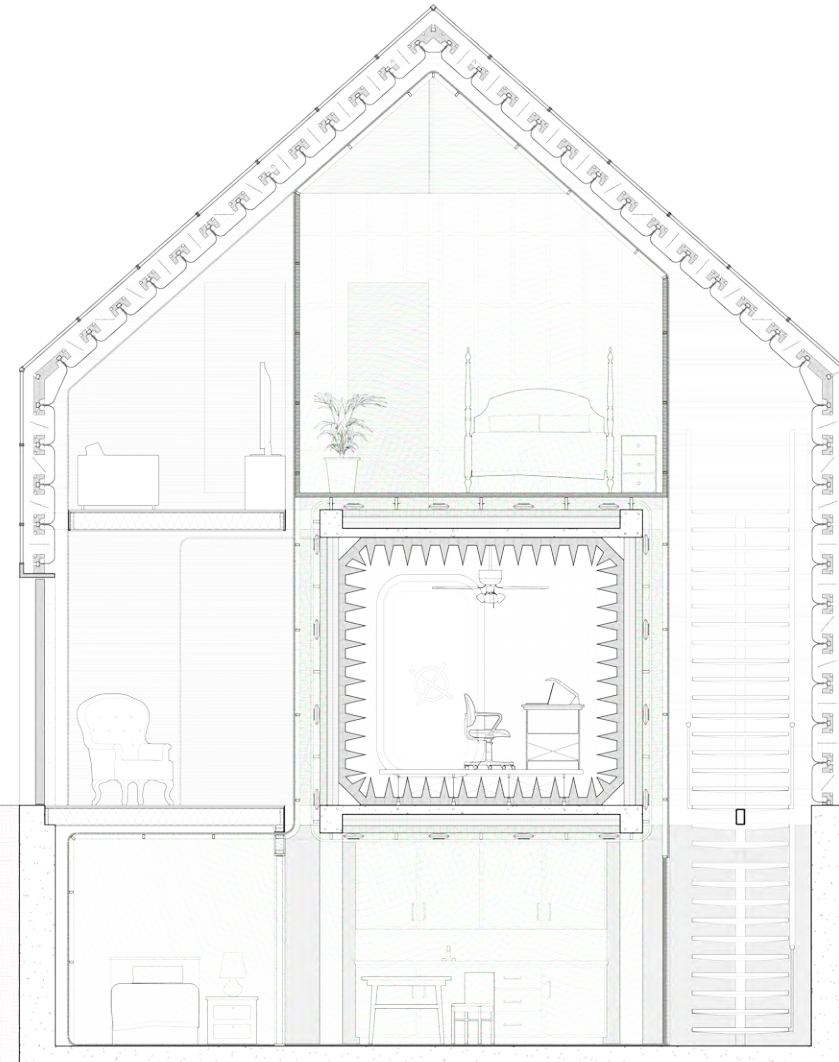
A series of nested envelopes generate a spectrum of interior zones from visually shielded to 100% blocked. Less private sacrificial zones at the perimeter of the house's section are available to actively spoof conditions of interior occupancy.

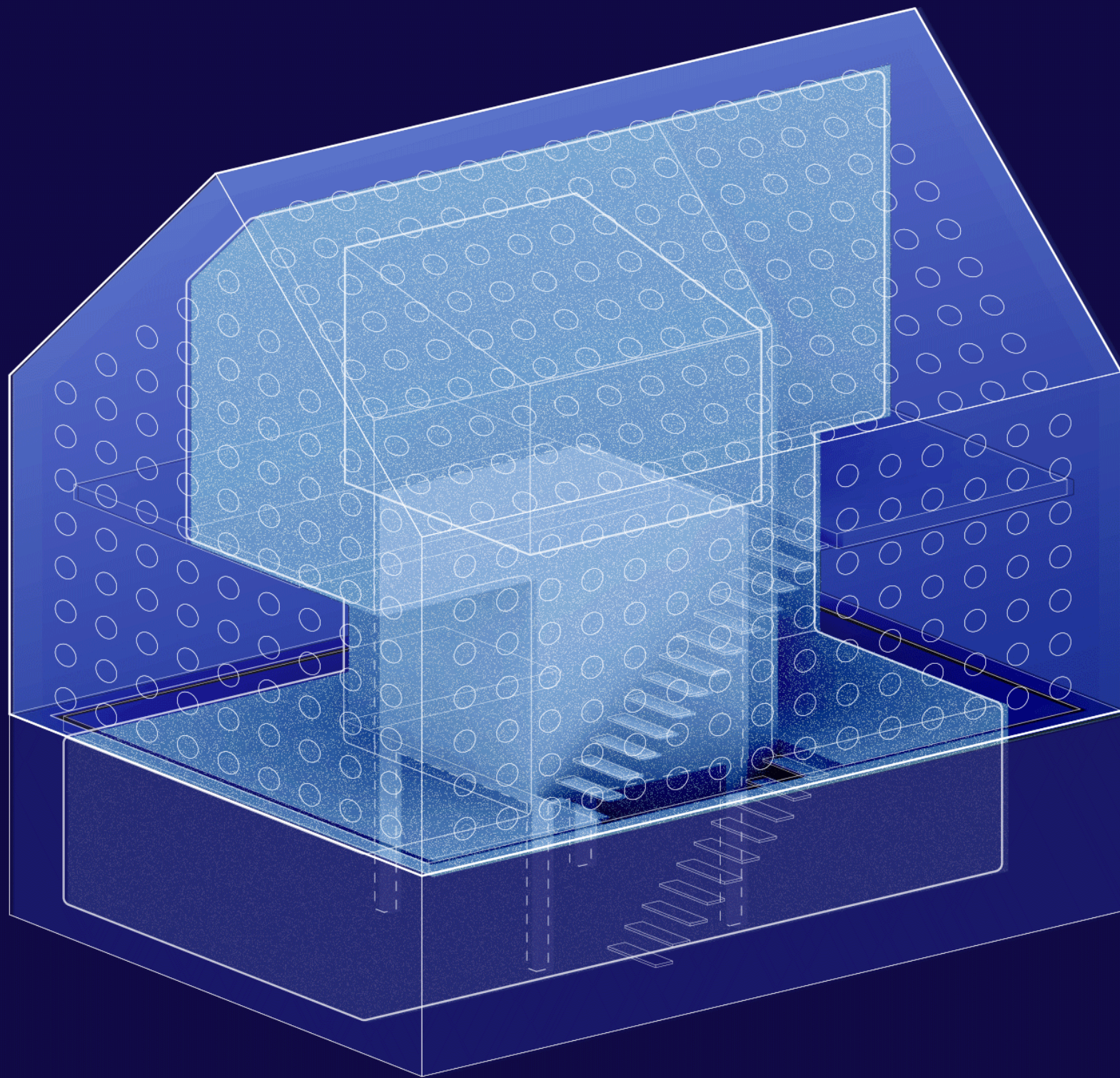
- A series of nested envelopes deny the transmission of sound, and electromagnetic waves from within.

Exterior:

Its exterior envelope actively spoofs and screens emitted signals providing a semi-transparent redundant layer of security.

- Its skin modulates occupational metadata by mechanical means. (borrowing from the dampen pavilion)





House 4

House 4 responds to the divergent privacy needs of a CIA family--needing simultaneously to mask, stop, and displace.

Interior:

Overlapping interior envelopes generate a variety of leaky spaces defined spatially by the type of privacy they afford.

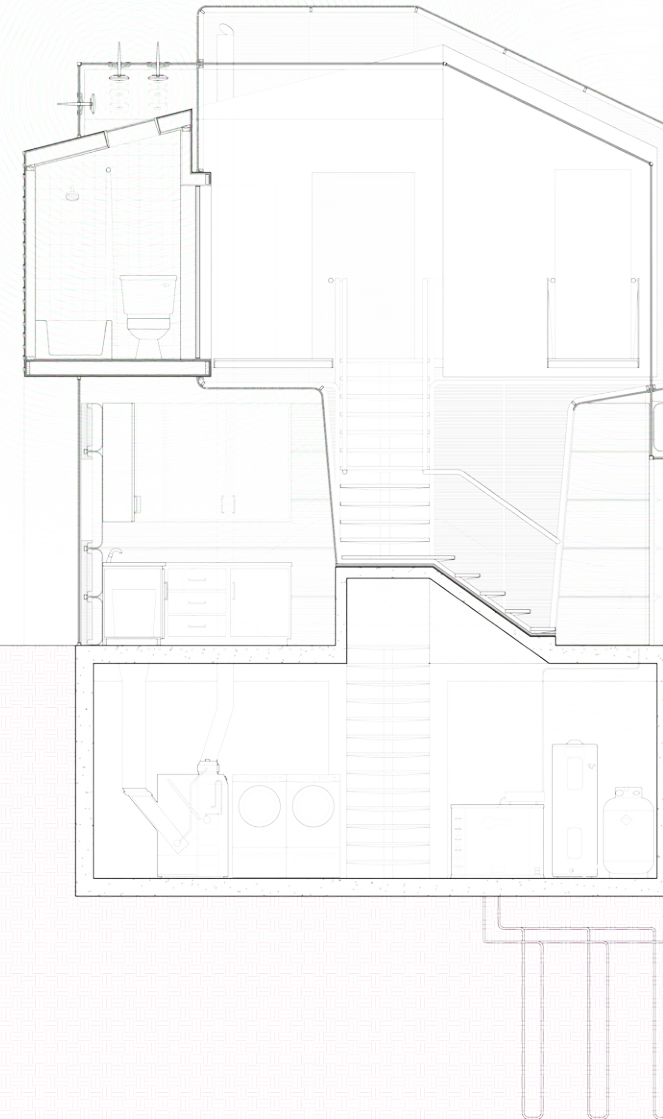
- A translucent faraday cage crafts electromagnetic privacy.
- A glass volume permits view in.
- A series of airgapped heavily insulated opaque volumes craft individualized thermal privacy.
- A series of opaque volumes solely craft visual privacy.
- A ring of transformable shielding spoofs and modulates ground floor leakage.

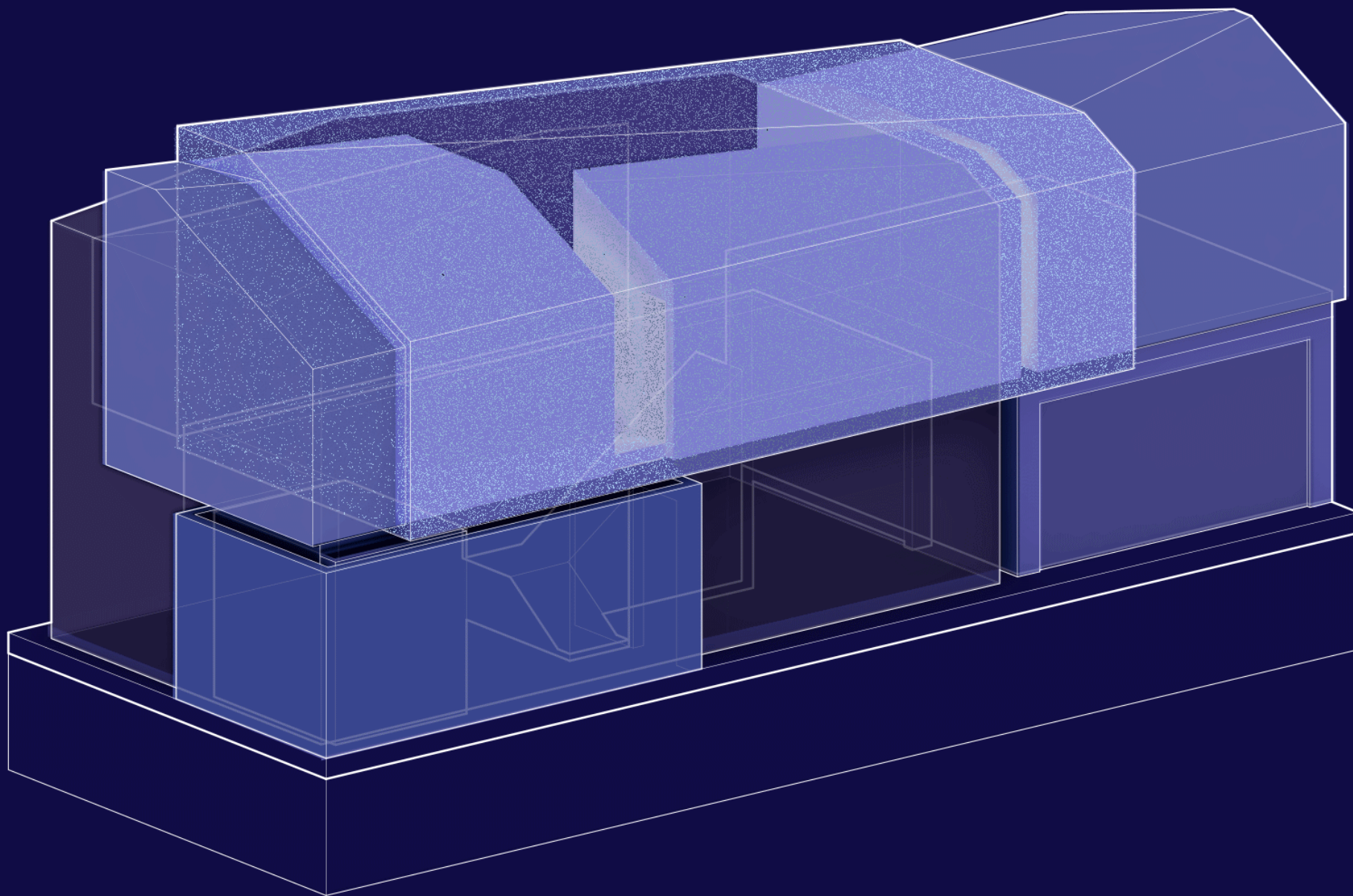
Exterior:

A bricolage of materials rather than a singular exterior envelope seeks to visually confuse.

Form:

Through its form, this architecture of accumulated volumes partially reveals the types of information allowed to pass. However, the collision of multiple envelope types makes it difficult for the surveillor to determine the exact source of the leaked information.





House 5

House 5 responds to the privacy needs of a politician who needs to ensure his contrasting public and private images.

Exterior:

A continuous, banal, McMansion-type envelope visually shields the home's secure zones from public view.

- The normative envelope visually spoofs its internal occupancy.

Interior:

Fragmented into larger envelopic zones, more private leak-proof spaces are nested within the formal conventions of the suburban interior--allowing for social and secure fragmentation within the family.

- A larger zone within the building shields the transmission of heat.
- A translucent Faraday cage blocks the emissions of electromagnetic waves.
- Isolated zones nested within craft a privacy detached from the home but securely connected to the world.

Form:

The presence of domestic formal affectations such as dormers, window shutters, and modeled roof line suggest a degree of residential normalcy expected of the suburban elite.

